



WIDER SIGNIFICANCE OF AUSTRALIAN OBSERVATIONS OF FALCON9 STAGE-2 PARKING ORBIT DEPARTURE BURN ON DEC 23, 2018



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REVIEW DRAFT 2

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PRESENTATION ORGANIZATION

- INTRODUCTION
- MISSION DESCRIPTION
- VISIBLE NATURE OF EVENT
- GROUND WITNESS REPORTS
- OTHER WITNESSES
- STARFIELD ANALYSIS
- RECAPITULATE – WHAT WAS SEEN VS PERCEIVED
- THE UFO ASPECT
- DEORBIT BURN & OBSERVATIONS
- OPEN ITEMS – FURTHER WORK
- SUMMARY & CONCLUSIONS

PURPOSE OF THIS REPORT

- 1 CATALOG INTERNET-ACCESSIBLE WITNESS REPORTS
- 2 CORRELATE OBSERVATIONS WITH KNOWN MISSION EVENTS
- 3 IDENTIFY AND ASSESS DISCREPANCIES
- 4 COMPARE WITH GROWING DATABASE OF PREVIOUS BURNS
- 5 ASSESS TECHNIQUES FOR IMPROVING FUTURE OBSERVATIONS
- 6 ENCOURAGE RESEARCH INTO PREVIOUS LAUNCHES' VISIBILITY
- 7 ENJOY ANOTHER 'SPACEFLIGHT SLEUTHING' EPISODE

importance of this event

- On Dec 23, 2018, a Falcon-9 rocket launched at 13:52 utc [GMT]
- Second stage reignition occurred halfway through first orbit, as planned
- This was 15:01 UTC, soon after midnight, Australian time .. But MANY people saw it
- Some made wonderful videos of the event and/or detailed descriptions
- Although Falcon-9 second stage reignition have been serendipitously observed before, they were mostly brief [~2 seconds] deorbit burns
- The BEST long-duration posigrade burn observed so far was the Falcon-Heavy trans-Mars insertion of the Tesla Roadster towards trans-Mars orbit on a special ascent profile never to be repeated
- **THIS event was a more common trans-GTO burn that occurs much more frequently BUT TO MY KNOWLEDGE IT'S THE FIRST SUCH BURN EVER OBSERVED AND IMAGED**
- The reason previous burns of this type have NOT been reported is geographical accident. Due to the high-inclination payload target orbit, the transfer burn had to occur at the southernmost point off the orbit which just happened to be south of Australia.
- The time-of-day and season-of-year also quite by accident enabled the observations of an illuminated plume in a dark sky. And by luck, cloud cover was absent.
- Normal geosync equatorial GTO insertion occurs over the South Atlantic south of Nigeria with far fewer observers. **So far NONE have been reported as having been seen.**

ANOTHER HARVEST OF AWESOME ACCIDENTAL IMAGES AND OFTEN-ASTUTE EYEWITNESS TESTIMONY



- **Joe O'Calaghan:** *"There was a point at which the leading section seemed to seperate leaving two pieces behind it as it forged forward."*
- **Phillip Somerville:** *"Large 'comet' fan-tail hanging in SSW sky @ 30° elevation, brightened and began moving due east, w/light dimming as visible smoke-condensation trail split into trailing 'fan' and forward moving 'smoke ring', accelerating."*
- **Zane Carney:** *"I observed a leading white orb which was followed by 2 brighter parallel orbs. A parachute-like trail followed these objects, the trail was divided into several parallel sections which had the appearance of noctilucent clouds."*
- **"Maty69r":** *"an extremely bright triangle of light appeared behind it, like a spotlight .."*

EYEWITNESS INTERPRETATIONS

- For everyone who saw and reported it, it was a first-in-a-lifetime view
- Various naturalistic explanations [comet, meteor] came to mind
- A few speculated it could have been a rocket [or couldn't have been]
- More of the witnesses interpreted and described it as a UFO
- This uncertain ambiguity of what observers thought it really WAS presented a significant challenge to private investigators to even know where to LOOK for useful observations
- In addition, those observers with exotic interpretations often described what they remembered seeing in non-standard terms
- **NEVERTHELESS the alertness and perceptiveness of dozens of such startled observers provided useful insights into the event.**
- **As with earlier rocket launchings, the eyewitness descriptions can help calibrate the expected accuracy/inaccuracy of reports of other objects**

RELATED REPORTS ON FALCON9 STAGE2 BURN OBSERVATIONS

- TRANS-GEOSYNC BURN [LONG AND POSIGRADE]
- **None known to have been observed [Gulf of Guinea region] HELP!!!!**
- EARTH ESCAPE BURN [TRANS-MARS; LONG AND POSIGRADE]
- http://satobs.org/seesat_ref/misc/180206_fh_s2_burn3_d2.pdf
- DEORBIT BURNS [VERY BRIEF AND POINTED FORWARD]
- http://satobs.org/seesat_ref/misc/180322-falcon9-deorbit-NORWAY.pdf
- http://satobs.org/seesat_ref/misc/181007-stage2_deorbit.pdf
- http://satobs.org/seesat_ref/misc/180314-falcon9s2-persian-gulf.pdf
- ANOMALIES
- http://satobs.org/seesat_ref/misc/180314-flcon9s2-indian-ocean.pdf
- http://satobs.org/seesat_ref/misc/180314-falcon9s2-australia.pdf

Payload: NAVSTAR 77

GPS-3 ----- The first GPS III satellite, SV01 'Vespucci', was launched on Dec 23 after many years of delays. GPS 3 is based on Lockheed Martin's A2100 bus. GPS 3 has a range of improvements, notably increased power and the new L1C civilian signal which will improve accuracy for non-military users. The satellite has a mass of 4400 kg including propellant. [JSR]

Events of mission:

<https://forum.nasaspaceflight.com/index.php?topic=46962.220>

Discussion of mission:

<https://forum.nasaspaceflight.com/index.php?topic=30912.420>

First cataloged object of this mission: [p = 6h10m]

2018-109A 2018-12-23 15:32 UTC - 1193/20200km/ 55.01°

NORAD ID: 43873 ⓘ

Int'l Code: 2018-109A ⓘ

Perigee: 1,198.7 km ⓘ

Apogee: 20,205.8 km ⓘ

Inclination: 55.0 ° ⓘ

Period: 370.0 minutes ⓘ

Semi major axis: 17073 km ⓘ

RCS: Unknown ⓘ

Launch date: [December 23, 2018](#)

Source: United States (US)

Launch site: AIR FORCE EASTERN TEST RANGE (AFETR)

LAUNCH AND SATELLITE DEPLOYMENT

Hour/Min/Sec	Events
00:01:04	Max Q (moment of peak mechanical stress)
00:02:44	1st stage main engine cutoff (MECO)
00:02:48	1st and 2nd stages separate
00:02:50	2nd stage engine starts
00:03:22	Fairing deployment
00:08:16	2nd stage engine cutoff (SECO-1)
01:08:51	2nd stage engine restarts
01:09:37	2nd stage engine cutoff (SECO-2)
01:56:17	GPS III SV01 deployment

WHY THE SPACE-X RELUCTANCE TO DESCRIBE POST LAUNCH ORBITAL MANEUVERS???

- THEY WON'T SAY – AND THEY HAVE ABSOLUTELY NO OBLIGATION TO PUBLICIZE SUCH INFORMATION
- COMPARISON WITH SECURITY AROUND SPACE SHUTTLE LAUNCHES OF CLASSIFIED MILITARY SATELLITES MAY BE GERMANE AND PROVIDE INSIGHTS BASED ON OVERLAP OF LAUNCH CUSTOMER NEEDS
- FOR MILITARY SHUTTLE MISSIONS, BASIC TRAJECTORY DATA [LAUNCH TIME, TARGET ALTITUDE & INCLINATION, BURN SCHEDULES/DURATIONS, ETC] WERE CLASSIFIED 'SECRET' BEFORE LAUNCH
- RATIONALE FOR THIS SECRECY MAY HAVE BEEN ASSOCIATED WITH NEED TO PREVENT ADVERSARIES FROM PROGRAMMING TRACKING ASSETS [GROUND, OCEAN-GOING, SPACE-BASED] TO MAKE DETAILED HI-RESOLUTION OBSERVATIONS OF BURNS WHICH COULD HAVE REVEALED PAYLOAD MASS DATA
- FURTHER: PREVENTION OF DISCLOSURE/DISCOVERY OF OTHER MILITARY PAYLOAD CHARACTERISTICS AS WELL AS CORPORATE PROPRIETARY TECHNOLOGIES AGAINST COMMERCIAL/INTERNATIONAL RIVALS
- CASE IN POINT, SOMETHING WE OUTSIDERS MOST DEFINITELY WERE NOT SUPPOSED TO SEE:
ZUMA! http://satobs.org/seesat_ref/misc/zuma_vs_falcon9-stage2_clouds_plumes_overview.pdf
- THE DEGREE TO WHICH PRIVATE ANALYSIS OF SERENDIPITOUS OBSERVATIONS OF SUCH EVENTS CAN UNEXPECTEDLY PROVIDE SIGNIFICANT INSIGHTS INTO PERFORMANCE/ANOMALIES IS ASTONISHING
- **WHICH MAKES PRIVATE OBSERVATION AND ANALYSIS ALL THE MORE FASCINATING**

SPECIAL FEATURES OF DEC 23 EVENT

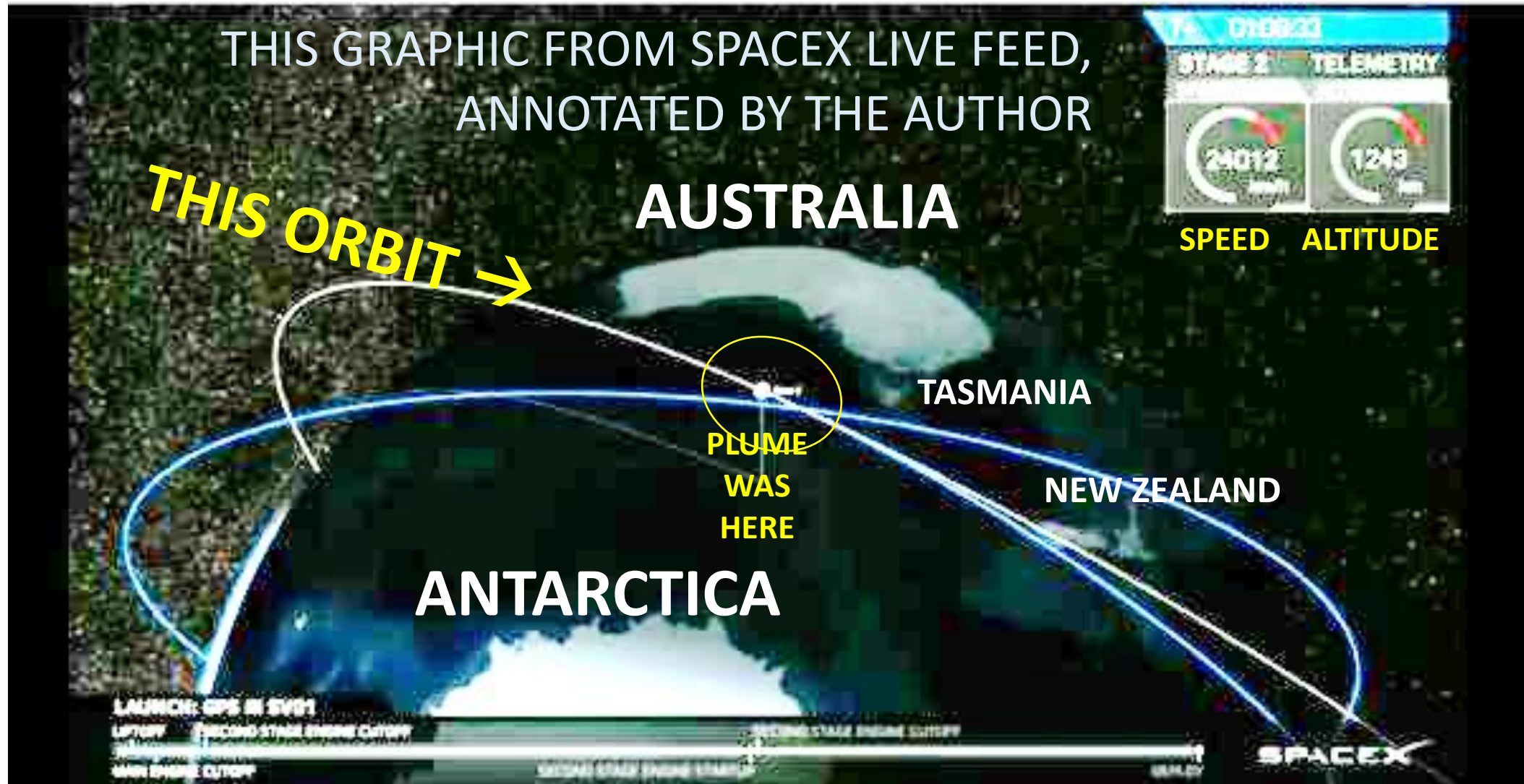
- PERHAPS 'ROUTINE', BUT IN NO WAY 'BORING'
- NOMINAL INSERTION INTO A NAVSAT ORBIT, TO BE REPEATED
- PARKING-ORBIT APOGEE UNUSUALLY HIGH
- REPEATED LAUNCH SCRUBS FRUSTRATED PRE-WARNED OBSERVERS
- FORTUITOUS TIME-OF-DAY LAUNCH CREATED SPECIAL ILLUMINATION
- ILLUMINATION ALSO ENABLED BY MIDSUMMER 'MIDNIGHT TWILIGHT'
- VERY DETAILED HIGH-QUALITY VISUAL DESCRIPTIONS OF BURN
- FORTUITOUS WEATHER IN SUB-SPACECRAFT REGION ALLOWED VIEWING
- ALMOST IMMEDIATE POST-PAYLOAD-DEPLOY DEORBIT BURN NOT SEEN

OBSERVATION/ILLUMINATION CONTEXT

- Entire southern coast of Australia
- 12/23/2018 15:00 utc
- Local time = UTC + 10:30
- Local 1:30 AM [Dec 24]
- Altitude 1230 km
- Sun Azimuth 192°, sun elevation -31°
- Sunset 10:00 PM [sighting was 3 ½ hours later]
- **Plume still visible because it was midsummer and 'high' latitude**
- Actual sub-spacecraft point [approx. 55°S, 144°E] sun elev -17°
- Shadowed region was approx. <300 km but plume alt >1200 km

VISIBLE NATURE OF EVENT

SPACECRAFT AT MOMENT OF ENGINE FIRING



This
pass:
55 S,
144 E

6 hr
later
55 S
126 W
[South
Atlan.]

<https://forum.nasaspaceflight.com/assets/46962.0/1535348.jpg> [BRIGHTENED]

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FALCON9 BURN of DEC 23, 2018

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'SE' MEANS
SUSTAINER
ENGINE

'S2' MEANS
START-2

'CO2' MEANS
CUT-OFF 2



19 Km altitude drop and an
increase in orbital velocity
registered by 45 second burn.

$$31405 \text{ Km/hr} = 8.72 \text{ Km/s}$$

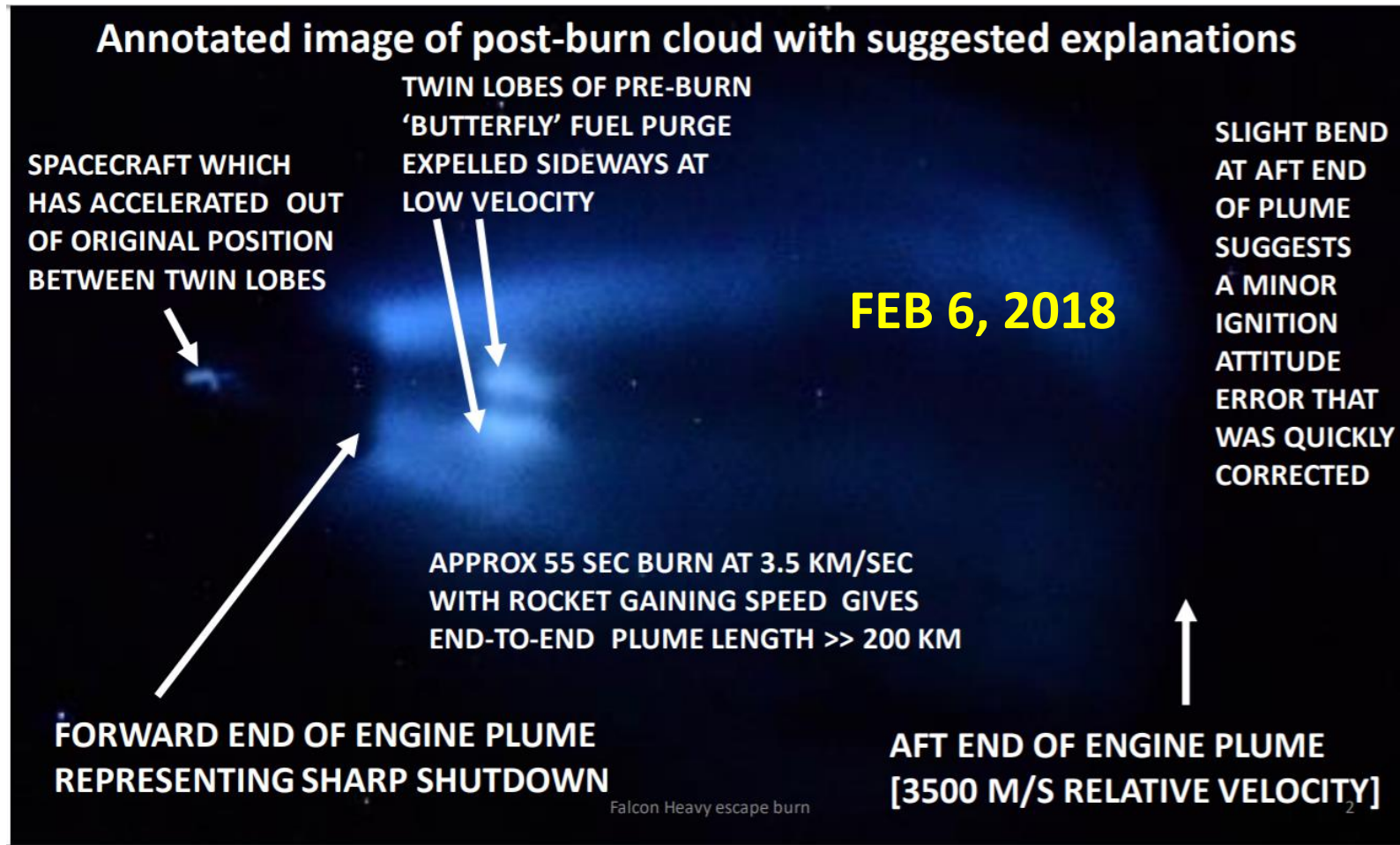
ONBOARD
TV VIEW
DURING
& AFTER
BURN, WITH
ALTITUDE,
SPEED, AND
TIME DATA.
FROM LIVE
SPACEX
VIDEO FEED.



trans-GTO
burn at
01:08:51 for
46 seconds

BEST PREVIOUS ANALOGY – FEB 6, 2018 REIGNITION
FOR TRANSMARS INSERTION SEEN FROM CALIFORNIA
[ON RIGHT, THREE VIEWS OF DEC 24, 2018 EVENT →]

http://satobs.org/seesat_ref/misc/180206_fh_s2_burn3_d2.pdf



04/30/2019

FALCON9 BURN of DEC 23, 2018

PHOTO: Philip Somerville



PHOTO: ANTHONY SALOTTI



PHOTO: Zane Carney



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VISUAL STAGES OF SECOND STAGE LONG-DURATION FIRING

2. SPACECRAFT BEGINS
SLOW OPPOSITE PLUMES
[engine temp conditioning]

3. SPACECRAFT
IGNITES ENGINE
& FAST PLUME,
ENDS SLOW PLUME

4. SPACECRAFT MOVES
AHEAD FASTER AS AFT
PLUME ELONGATES

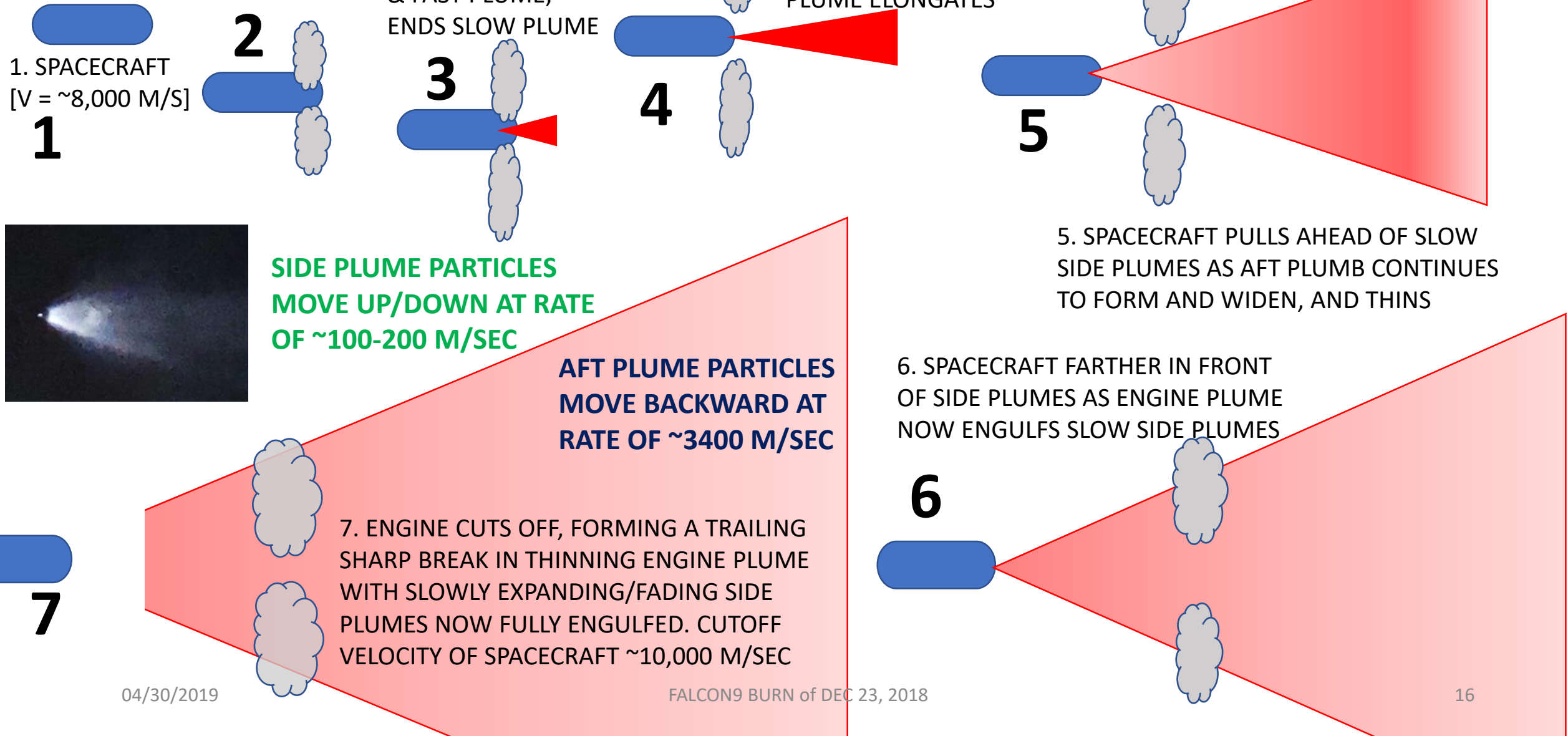
5. SPACECRAFT PULLS AHEAD OF SLOW
SIDE PLUMES AS AFT PLUMB CONTINUES
TO FORM AND WIDEN, AND THINS

6. SPACECRAFT FARTHER IN FRONT
OF SIDE PLUMES AS ENGINE PLUME
NOW ENGULFS SLOW SIDE PLUMES

7. ENGINE CUTS OFF, FORMING A TRAILING
SHARP BREAK IN THINNING ENGINE PLUME
WITH SLOWLY EXPANDING/FADING SIDE
PLUMES NOW FULLY ENGULFED. CUTOFF
VELOCITY OF SPACECRAFT $\sim 10,000$ M/SEC

**SIDE PLUME PARTICLES
MOVE UP/DOWN AT RATE
OF $\sim 100\text{-}200$ M/SEC**

**AFT PLUME PARTICLES
MOVE BACKWARD AT
RATE OF ~ 3400 M/SEC**



GROUND WITNESS REPORTS

- ARCHIVAL COLLECTION OF WITNESS DESCRIPTIONS AND IMAGERY.
- COLOR-CODING OF HIGHLIGHTS ALLOWS FAST SKIMMING
- COMMENTS OFTEN REFLECT SHARP VISION AND MEMORY
- COMMENTS SOMETIMES REFLECT GROSS MISUNDERSTANDINGS
- COMMENTS SOMETIMES REFLECT 'CONFIRMATION BIAS'
- CAN'T BE SAID OFTEN ENOUGH – THE WITNESS REPORTS CAN BE EXTREMELY IMPORTANT IN SUCH UNEXPECTED APPARITIONS AND EVERYONE WHO FILED REPORTS SHOULD BE CONGRATULATED
- CONCLUSIONS AND OPEN ISSUES AT END OF REPORT



Just saw most amazing sky-light show.

Large 'comet' fan-tail hanging in SSW sky @ 30° elevation, brightened and began moving due east, w/light dimming as visible smoke-condensation trail split into trailing 'fan' and forward moving 'smoke ring', accelerating . No boom, noiseless.

[Phillip Somerville @unitambo](#)

Possible SpaceX second stage booster over S.E Australia. Sighting **also reported from Tasmania**, seen in <http://Nth.sky>.

Pic below taken overhead from Bairnsdale in East Vic. Sighted SSW of Omeo, travelling N.Easterly. [@elonmusk](#)
[@SpaceX](#) [#SpaceX](#)
pic.twitter.com/6le6gj38mH

NEWS

SPORT

ENTERTAINMENT

BUSINESS

LIFESTYLE

VIDEO

BREAKING NEWS

WESTERN AUSTRALIA

NATIONAL

WORLD

TECHNOLOGY

OPINION

WEATHER

Picture: Supplied

SA News

Santa or SpaceX? South Australians report weird object in the early hours of Christmas eve

Southwest Australia



<https://www.perthnow.com.au/news/sa/santa-or-spacex-south-australians-report-weird-object-in-the-early-hours-of-christmas-eve-ng-ccb12971569f35c026edb17a15a636c5>



*UFO spotted
across South
Australia.
Santa or
SpaceX?*

*Photo
Anthony
Salotti from
Myponga.
Picture: The
Advertiser*

https://images.perthnow.com.au/publication/CCB12971569F35C026EDB17A15A636C5/1545630022081_5053374dad64c81a3630b767b42e1dbc.jpeg?imwidth=668&impolicy=pn_v1

The light, as seen
from a paddock
about 30km from
Karkoo around
1.30am. Photo:
Ethan Secker
Picture: Supplied



https://images.perthnow.com.au/publication/CCB12971569F35C026EDB17A15A636C5/1545630022081_ff5aee4108fb5be8e509d19f76f8b1ac.jpeg?imwidth=668&impolicy=pn_v1



Tarquin Schahinger

December 23 at 7:12 PM

I saw this last night around 1:30am south Australia



Australian Meteor Reports
[FACEBOOK GROUP]
NAVSTAR 77 (USA 289)
GPS III == 2nd stage reignition
and cut off SES2 - SECO2
witnessed from Adelaide, Australia


Belinda Simpson == so awesome, I wonder if that will become a new category of Astro photo people try to get, **there are more and more launches now so opportunities will increase**. The tough part will be knowing when and where to see them.

<https://www.facebook.com/groups/AustralianMeteorReports/permalink/1011430795727565/>

“Australian Meteor Reports” comments

- **Dale Benson** == For us **it looked much further away** but was the same time give or take, was hard to make out but the exact same shape, and appeared to leave **puffs of smoke** or something every minute or so, not sure what it was
- **Damian Reed** == Awesome. Saw that too from Adelaide and figured it was a rocket. Couldn't get a pic with stupid phone camera. Moon washed it all out.
- **Joe O'Calaghan** == I saw it from Bredbo NSW thought it was around three am. There was a point at which the leading section seemed to separate **leaving two pieces behind it** as it forged forward. Is there anyone out there who can explain what this moment was. Thinking it may have been a second boost of energy as it discarded spent material. Absolutely incredible sight lovely to find others who witnessed it in all its glory. Thanks in advance for any info 🙏 Seasons greetings to u all.
- **Nat Web** == Yes saw it near Birdwood SA. **Was above Eastern horizon and appeared to be moving SW [JO: reversed?]**. Looked human-made.

Australian Meteor Reports == more

- **Emma Jane** == I saw this over Rosebud area in Victoria - **was very close** and vivid and had intense colour changes through the trail - finally found this page which has explained what I saw! super cool experience to witness this 
- **Luke Corcoran** == **Funny rockets go sideways**
- **Ravi Jagtiani** == You were looking South at an elevation of 17 degrees.....
- =====

<https://twitter.com/twitter/statuses/1076860558878470144>

Rowena B @GixxerDracs == Used to see from QLD [Queensland] the space shuttle going up in the 90s. Depends on angle of launch & length of the burn. Around a 52 degree launch angle with a 8 minute + burn and you could see the SRBs coming off the shuttle **[JO: SIC!]**. Like a mirage in the desert. This is a 2nd stage SpaceX burn.



Darren Lane
December 23 at 5:58 PM
[JO: CLOCK TIME??]

Jessica Cameron ==
Gotta love a rocket!
<https://www.facebook.com/groups/AustralianMeteorReports/permalink/1011406145730030/>

Carl Mckavanagh

December 24 at 5:41 AM

Tuross Heads 2am 23/12/18

**JO: AWESOME catch of twin
side lobes with main plume
dropping behind as vehicle
accelerates to the left**



<https://www.facebook.com/groups/AustralianMeteorReports/permalink/1011703335700311/>

Tash Lohrey // December 23 at 2:39 PM

Can anyone tell me what this is please?? Sorry it's such a bad video, it started as a really bright orb shape and moved across quite slowly and **slowly spread out**.... This is over Burnie Tasmania, it was about **2am** this morning. Sorry can't give you a more specific time. It was so clear and vibrant. we just happened to be outside at the right time, just as it started. We only noticed it because suddenly there was this bright orb looking thing. I thought it was a comet.... my hubby took them but with a phone it was hard to get a super clear shot

<https://www.facebook.com/natascha.lohrey/videos/10156778953356221/>

Daniel McNally == If this was over Melbourne I saw it too [in a southern direction] it was roughly 2:05am this morning was amazing to see!

Lohrey thread p. 2

Matt Harding == I spotted this also from Ballarat just after 2am. Came into view from the SSW, increasing in size and brightness and then forming **a large, bright conical plume** as it was close to due south; then continuing to the ESE. I ran in to get my phone and wake the misses; sadly I couldn't focus the phone to get a pic/vid worth taking.

Daniel McNally == You sir win the description game! That is exactly how it looked, and spot on with the coordinates too.

Sue Taylor == This was **seen over Woodend** by my partners son. He thought it was a meteor. He was shocked to find out he'd seen a rocket separation.

Sam Bothamley == Saw this as well, never seen anything like it, Was on rye pier throwing in a line at the time and looked up and saw it. Absolutely amazing



Joel Legg December 23 at 5:42 PM

<https://www.facebook.com/groups/AustralianMeteorReports/permalink/1011401379063840/>

- Hi. Guys I think I saw a comet last night in Melbourne. I was in Dandenong **facing south east**. It was moving slowly from right to left. There was a large ball with **a short white blue-ish blur behind it**. Then **behind it separate from the ball was like a wall of colour**. Blues and greens following it. I was in such awe I didnt take my phone from my car. But what does that sound like?

<https://www.facebook.com/photo.php?fbid=2400228576715236&set=p.2400228576715236&type=3&theater&ifg=1>

- **Shelley Jarrott ==**
Thanks for that I saw it to by sheer chance, thought I was seeing things so glad I have an explanation. Actually pulled over to pics on my phone.



FACEBOOK IM [DEC 29] -- Hi James it was **the most amazing thing I've ever seen**, I feel so privileged to have seen this in my lifetime. I did video it but quality not great I thought I was seeing things that morning so glad I stopped and took lots of photos and videos, thanks for contacting me I was so fascinated and still am.

https://scontent.fhou1-2.fna.fbcdn.net/v/t1.0-9/48429052_2400228580048569_2192755472337993728_n.jpg?_nc_cat=105&_nc_ht=scontent.fhou1-2.fna&oh=e5b0389775430222dae593d1cab634a6&oe=5C949267

Shelley Jarrott photo



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FALCON9 BURN of DEC 23, 2018

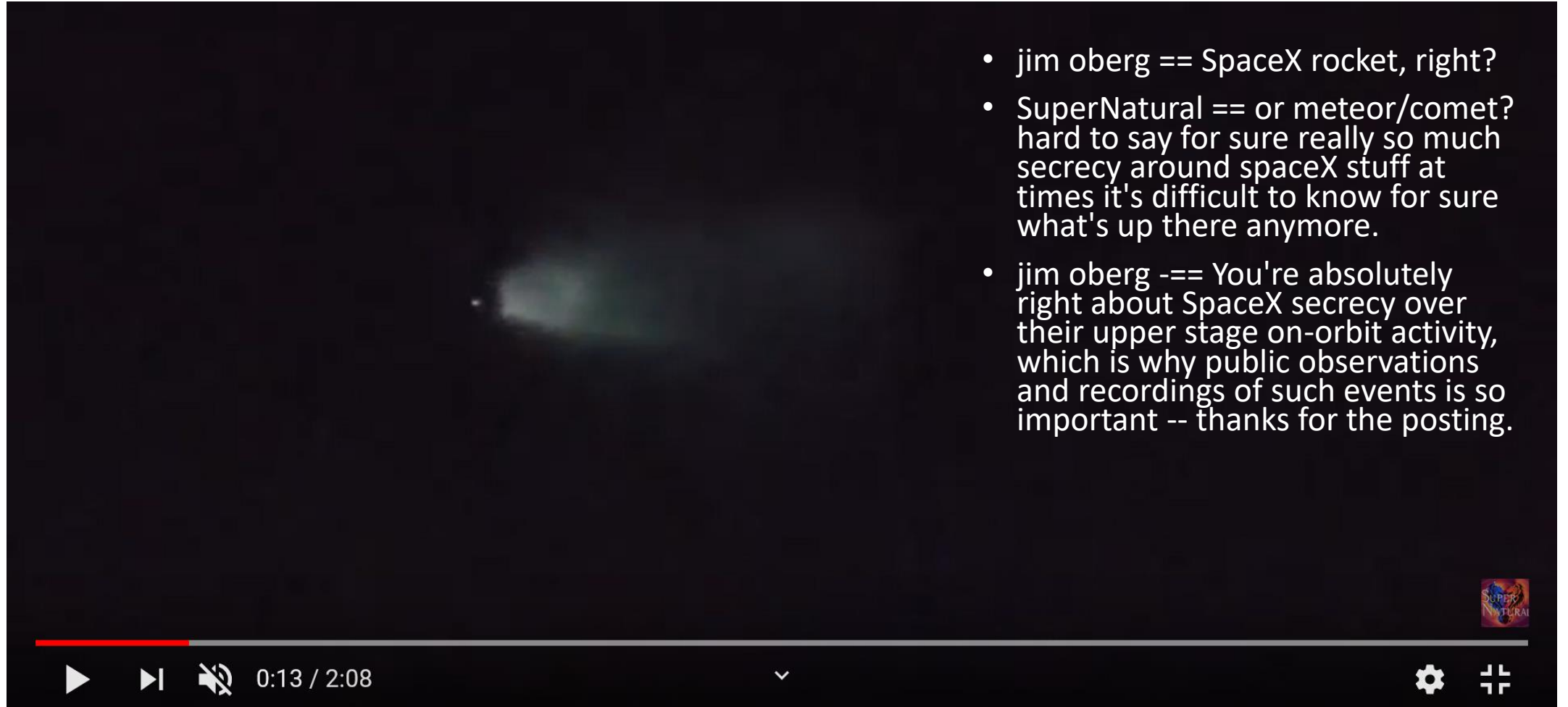
JO: AWESOME
catch of twin side
lobes with main
plume dropping
behind as vehicle
accelerates to the
left

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More Strange Sights in the Skies

‘SuperNatural’ published on Dec 23, 2018

<https://youtu.be/pwrsGAMHmWc>



- jim oberg == SpaceX rocket, right?
- SuperNatural == or meteor/comet? hard to say for sure really so much secrecy around spaceX stuff at times it's difficult to know for sure what's up there anymore.
- jim oberg -== You're absolutely right about SpaceX secrecy over their upper stage on-orbit activity, which is why public observations and recordings of such events is so important -- thanks for the posting.

ufo over Melbourne!!! 24 Dec 2018 approx 2.00am



ENLARGED



▶ ⏩ 🔊 0:22 / 1:05

<https://youtu.be/LwJaNaxoDuU>



Hayden Charles real-time video transcript

oh s**t oh s**t what is -- what is that?

is it a comet -- tell me this is what the f**k is that!

it's like **a messy parachute** like holy s**t, like oh holy crap what the f**k is that?

what is he so – crap, like hopefully it's showing up

well that's insane hold it steady oh yeah yeah

oh no **it's sort of separating** from the -- the panels [?]

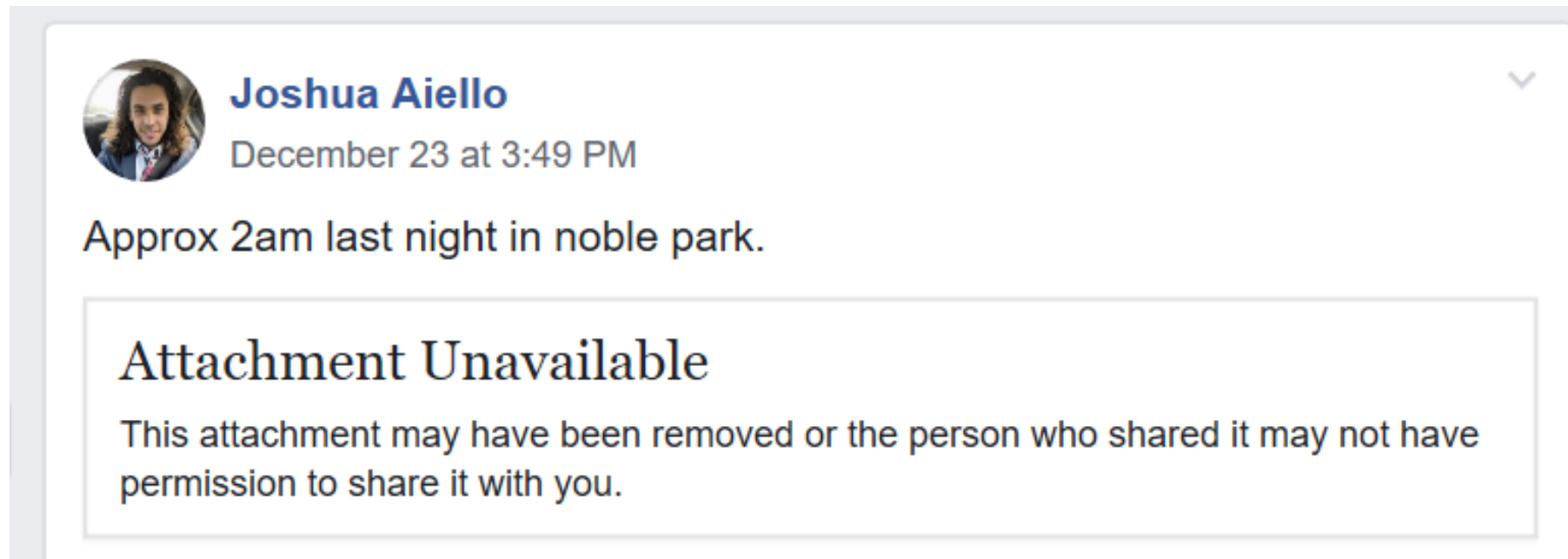
what what the hell I'm gonna take some photos

[garble garble]

Hayden Charles video viewer comments

- Ryan Williams == I totally agree bro, I was outside with the planetary app and google maps to try and work it all out and **it just doesn't make sense at all**. ... I cannot find any info on a launch other than the one in the USA haha and **I highly doubt that it was the same one**.
- Mark Bamford == I too saw this last night I live north north east of Melbourne and this craft was to the south towards Tasmania flying east the moon was very bright with a crystal clear sky I tried to take a video but my phone was not good enough **the tailing plume was massive** it was a privilege to have witnessed it awesome
- NEO O == Yea the only thing that would convince me it's a UFO is if it did something aerodynamically that we cannot do.. like change direction instantly, extreme acceleration, no sound generation and no contrails. If they can get here from across the cosmos they are using a propulsion system that can pretty much do anything
- Jazzy Goddess ==It looks like a rocket in the deep atmosphere though, like the distance of the ISS or even higher, thing is, it's probably enormous and literally the size of the biggest rocket (if not bigger)
- Secureteam Research == Hi, I am a researcher for the Secureteam UFO channel, and I wanted to know if it would be alright for us to analyze and share this video with our viewers. All credits to you of course and we'll link back. Thanks! **[JO: Never used on site]**
- Hayden Charles == sure thing (sorry about all the swearing), if you check my second upload I talk through it a bit more, but the parachute looking thing is less obvious

Some images posted, then removed!



<https://www.facebook.com/groups/AustralianMeteorReports/permalink/1011367462400565/>

Aiello video

- JO: if you posted and deleted images of the dec 23 spaceX rocket burn, on the meteor page, i'd love to see them.
- Hi James Here is the video that I filmed that night from Melbourne Australia
- JO: [chart p. 73] Does this make any sense?
- If I had the knowledge of rocket physics and the like as you do, then it would make sense to me a lot more than what it currently is. I get it but it's a bit too verbose for my current understanding of science.
- JO: Thanks it was very dense, it's a chart for a much longer slide show I can email you. You're still on the 'front line', I envy you, and deeply appreciate the sharing of experiences

Aiello video - clock time 04, 15, 26,,39, 51, 64



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GPS III Space Vehicle 01 // COMMENTS

https://youtu.be/yRiLPoy_Mzc

- NASA THE POTATO == I saw this **go over head** in melbourne. It was beautiful
- John Croucher == The orbital burn was visible from southern Australia. It made the news with people saying they saw a UFO :D
- JO == What time was it? And what details did you see? I'm a retired 'rocket scientist' doing reports on visual observations of launches and on-orbit rocket firings. Example: FH [falcon heavy] escape burn to Mars Feb 06, 2018 observed from SW USA
- Florence Gomer == **Did anyone in New Zealand South Island see the SES2 burn high in the sky? Would this also have shown up on Himwara or other satellite images? [later] Reports the SES2 burn was seen from SE Australia or Tasmania. Any video taken from ground? [later] They would have seen a bright light for up to 47 seconds moving fairly rapidly across small part of the sky. I have seen several people commenting they saw this, but haven't seen anyone post a video of it.**

https://youtu.be/yRiLPoy_Mzc

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04/30/2019

FALCON9 BURN of DEC 23, 2018

Another tweet



<https://www.facebook.com/photo.php?fbid=2097207177030863&set=p.2097207177030863&type=3&theater>

No longer available — “The link you followed may have expired, or the page may only be visible to an audience you're not in.”



The Advertiser

December 23 at 10:27 PM · 🌐

Is it a bird, is it a plane, is it... Christmas coming early?
We're pretty sure we now know what this mysterious light is from, but we're not going to spoil your fun speculating.
[FREE TO READ]



<https://www.facebook.com/theadvertiser>



ADELAIDENOW.COM.AU

Santa or SpaceX? Weird light spotted over SA

A STRANGE, oddly-shaped light, spotted in the early hours of Monday...

04/30/2019

FALCON9 BURN of DEC 23, 2018

LOCAL NEWS COVERAGE

ADVERTISER comments

- **Shane Barker** == It's Lord Musks rocket
- **Derek Hasel** == Probably Elon Musk's Military space craft which was successfully launched yesterday, which the Murdoch press didn't mention !
- **Nick Evenden** == I wish you would do some research before blurting out something about a ufo. If you knew the SpaceX rocket launched last night it wouldnt take much to figure out it was the 2nd stage boosting over us at over 1000kms high. I thought you were meant to tell us the news not the other way around. Fml
- **Topher Chapman** == It was the second stage of the space x rocket, moving from low earth to mid earth orbit to launch a satellite, check the latest space x video on YouTube around 1:20:00.... I saw it from canberra, very similar to the LA bloom of a previous space x launch

ADVERTISER [2 of 2]

- **Monica Victory** == Or **plane with headlights** on going through light bit of cloud!
- **Jason Templeton** == Saw that when I woke up to see the kids. Will take a look later. People from Tassie to Melbourne reported seeing it which is pretty amazing
- **Tiarne Easley** == Hahah ours definitely didn't seem like it was moving! Maybe we were all drunk?
- **Jon Hetherington** == I saw this fishing last night at Binalong Bay [north east tas]. I never go night fishing and it was incredibly spectacular. I was swearing out loud myself. I have seen some stuff before, but this was so immense and eerie, and awesome!!
- **David Maxwell** == FYI we saw this on the drive from canberra to melbourne last night, a looong way from South Australia.
- **Tracey Smoult-Probert** == it apparently was seen in South Australia , N.S.W and one other state but cant remember what they said
- **Andrew Ludlow** == Im in Altona, Melbourne and took pics of it. **It was South** and the moon was North and bright.

giuseppe

- The Doctor @JamesSJBromley 26 Dec 2018 == I saw it from Mitcham foothills Adelaide. **It came from SW faded in/out moved slowly to NW did same twice in same spot** then moved did it again a few times then moved to NW more fade out then **a bright flash like a torch in the distance** then disappeared.
- Mark Sloane @Marksloane9 24 Dec 2018 = I also saw this in Victoria north north east of Melbourne looking south awesome sight
- James Hynes @kamenrangerXVI 27 Dec 2018
- This was a rather unique. Most launches from Florida, eg to ISS or a geostationary satellite, fly southeast over the Atlantic & Africa. Second stage relight usually happens over Indian Ocean out of view. This flew northeast following the eastern US and flying over the UK & Europe
- https://twitter.com/pangallo_/status/1076860558878470144?ref_src=twsrc%5Etfw%7Ctwcamp%5Etweetembed%7Ctwterm%5E1076860558878470144&ref_url=https%3A%2F%2Fwww.adelaidenow.com.au%2Ftechnology%2Fscience%2Fstrange-unidentified-light-seen-over-south-australia%2Fnews-story%2F12f1ebe06f3174dfc2231f19b62e5a46



Giuseppe
@pangallo_

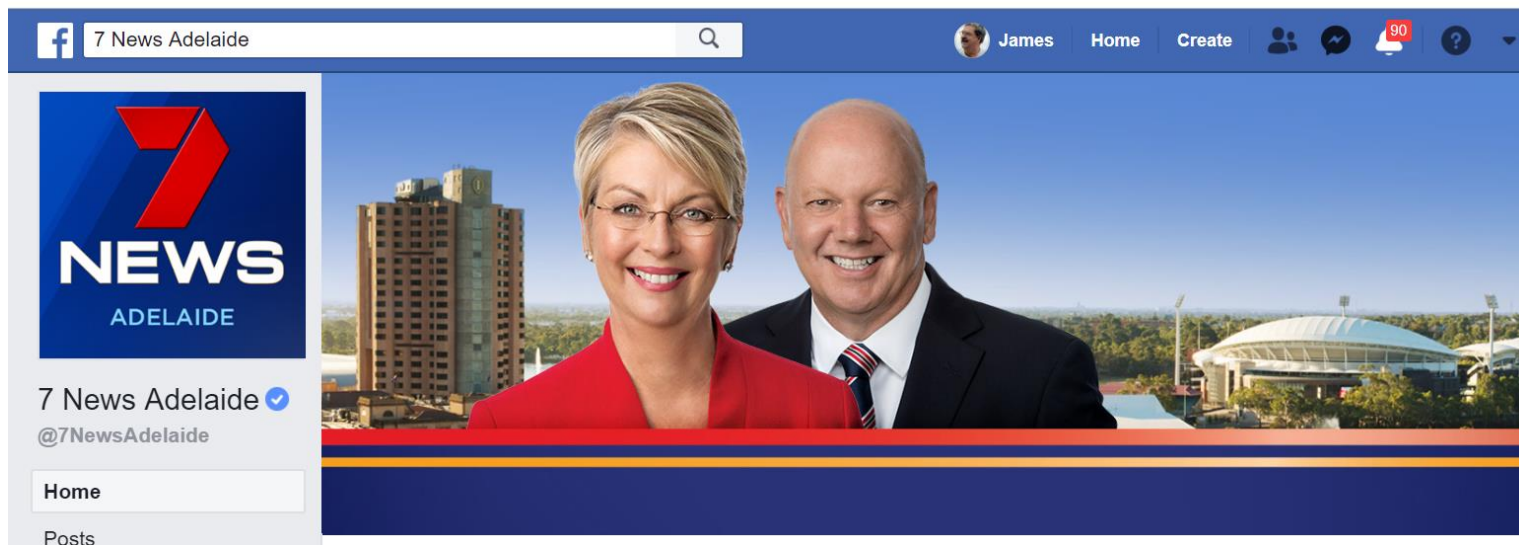


Just saw this light up the sky. [#Amazing](#) [#Adelaide](#)
[#SouthAustralia](#) [#astronomy](#)

♡ 26 9:22 AM - Dec 23, 2018

MORE IN SCIENCE

Giuseppe@pangallo_



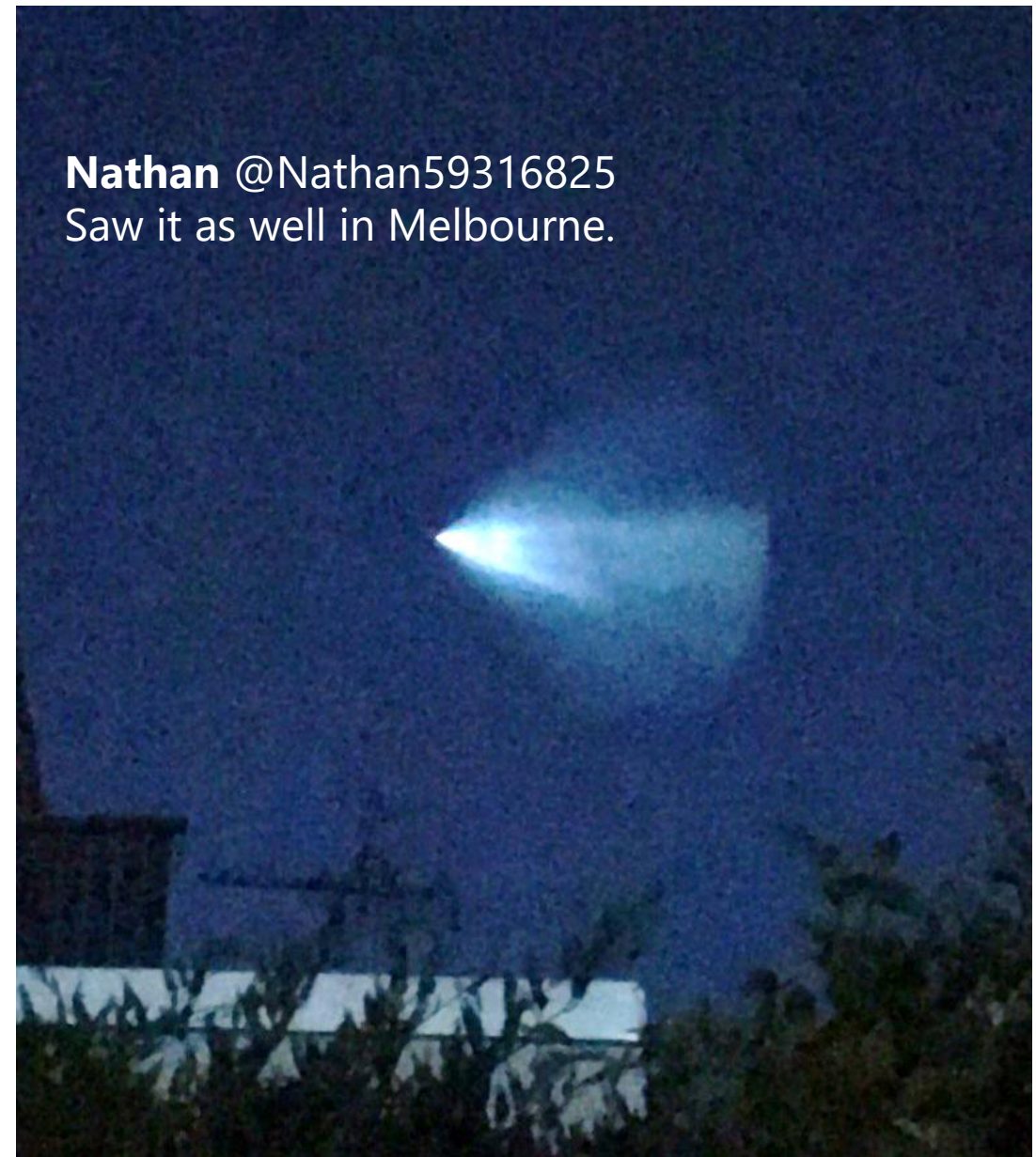
Adelaide news

- **Bronwyn Michelle** == From SEVEN NEWS site [December 24, 2018 at 12:43 AM]: "Some strange lights in the night sky left many South Australians a little perplexed early this morning - but experts believe it was Elon Musk's latest SpaceX rocket."
- <https://www.facebook.com/7NewsAdelaide/videos/>

7NewsAdelaide

- A bright burst of light in the skies above Adelaide had many people scratching their heads early this morning.

Witnesses could **hardly believe their eyes** when the strange object suddenly appeared, saying **it was like something out of a sci-fi movie.**



7NEWS

- **Ryan Rugari** == It was a damn falcon 9 space x rocket god stop making it out to be such a big unknown.. the falcon 9 spotting in south australia is already and amazing story ffs
- **Pope Jp** == **Time difference** (states to adelaide) **doesn't match** to be the falcon 9 sorry ppl! It was just a hot air balloon
- **Marthese Agius** **Rockets go up not sideways**
- **Caitlyn Degoumois** definitely was a ufo
- **Shaun Weller** SpaceX has a launch for the 23/12 from Cape Canaveral, A Falcon 9 launching U.S. AIR FORCE (GPS III SPACE VEHICLE 01). I doubt that's what we saw though, **we don't usually see anything from their launches like this**
- **Nate Lachlan** Put a globe in the background and you are an expert.
- **Vicky Kikidis** == *that footage doesnt do justice was unreal*

<https://www.facebook.com/7NewsAdelaide/videos/1885414224840697/>



- [Billy Powell](#)
- Captured at Black Forest [an inner southern suburb of Adelaide]



<https://www.facebook.com/photo.php?fbid=10214769371921155&set=p.10214769371921155&type=3&theater>

04/30/2019

FALCON9 BURN of DEC 23, 2018



Brad Walton

Seen it from strathalbyn SA
[60 km southeast of Adelaide]



<https://www.facebook.com/photo.php?fbid=10212727244050349&set=p.10212727244050349&type=3&theater>



04/30/2019

- **Trevor Viant == I seen it too**



FALCON9 BURN of DEC 23, 2018

Dimitri Papadopoulos [Bourke, New South Wales]



<https://www.facebook.com/photo.php?fbid=10158147696281110&set=p.10158147696281110&type=3&theater>





Papadopoulos



Via facebook IM

<https://www.facebook.com/topher.au/posts/728944097467168>

- December 24 at 2:03 AM == Anyone else see that s**t? Check snap.... I think it was something leaving the atmosphere, rocket launch or something... It was like a comet but **really bright** when it started.... It lasted like **2 mins** then faded over about 5
- **Nicole Lee** == I was out back having a smoke and just seen like a flash of light then **it went to a glowing cloud**. Couldn't get my phone out quick enough
- **Adele Waldock** == It is so fuzzy, what is it toph?
- **Dorota Dotti Habiniak** = Coen Teusner and I saw it from my stagea!!!! Was amazing hey!!
- =====
- **Coen Teusner** // December 24 at 2:06 AM
- <https://www.facebook.com/coen.teusner/posts/2303965669624920>
- Anyone else see that comet just before or nah?... oh s**t man! Looked unreal. Didn't believe it at first haha
- **Andy Qu** -- Thought I was trippin.. So there was a red flash

'Adelaide Now' news website

- **Peter ==** We saw it from the Barossa **looking south** at about 2am . Roughly thirty minutes after the launch from Cape Canaveral . Which ties in nicely with the required boost from low earth orbit (100 mile) to the final orbit of the GPS satellite at the 1200 mile altitude. Very spectacular and a once in a lifetime event .
- **No Comment ==** Interesting. News Corp reports Space X launch at 8:51am local time, as in Cape Canaveral. Florida is 15.5 hours behind us which means launch was at 12:21am SA time. **Pretty sure it doesn't take over an hour to reach space.**
- **Eric ==** Looks very much just like a very, very large rocket.
- **Geoff ==** Interesting correlating the different sightings, **not entirely consistent at all... [JO: SEE NEXT PAGE]**
- <https://www.adelaidenow.com.au/news/south-australia/santa-or-spacex-south-australians-report-weird-object-in-the-early-hours-of-christmas-eve/news-story/ccb12971569f35c026edb17a15a636c5>



Phillip Somerville

@unitambo

Follow



Possible SpaceX second stage booster over S.E Australia. Sighting also reported from Tasmania, seen in [Nth.sky](#). Pic below taken overhead from Bairnsdale in East Vic. Sighted SSW of Omeo, travelling N.Easterly. [@elonmusk](#)
[@SpaceX](#) [#SpaceX](#) 12:52 PM - 23 Dec 2018



SOMERVILLE TWEET

https://twitter.com/unitambo/status/1076943678533296128?ref_src=twsrc%5Etfw%7Ctwcamp%5Etweetembed%7Ctwterm%5E1076943678533296128&ref_url=https%3A%2F%2Fforum.nasaspacelight.com%2Findex.php%3Ftopic%3D46962.220



MORE.....

Phillip Somerville @unitambo · Dec 23

Just saw most amazing sky-light show. Large 'comet' fan-tail hanging in SSW sky @ 30° elevation, brightened and began moving due east, w/light dimming as visible smoke-condensation trail split into trailing 'fan' and forward moving 'smoke ring', accelerating . No boom, noiseless.



1



Phillip Somerville @unitambo · Dec 23

Southern Hemisphere...



1



Phillip Somerville @unitambo · Dec 23

Full moon, cloudless sky, little lower atmos dew. 0235-40'ish AEST.



1



Phillip Somerville @unitambo · Dec 23

RAAF testing their stealthy new toy I believe. Fits geo-vector and possible 'hanging' afterburner-climb. Trans-sonic 'donut' vapour cone? Delta exhaust flare of note...



1

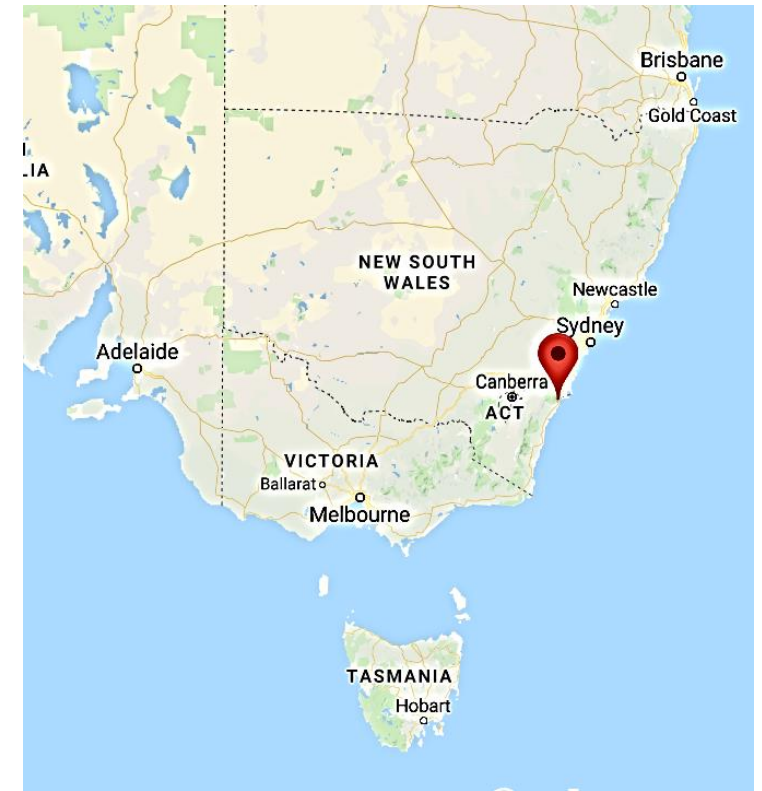


Rocket launch seen from Burrill Lake -
24th December 2:05am

<https://youtu.be/FB21iC3ebKE>

Sydney Multirotor Racing Club, Sutherland Shire //
Dec 23, 2018

- Looking **south-southwest** from Burrill Lake over the top of the Big 4 Caravan Park. A clear night with no cloud, **this "blurry star"** was seen and noticed to be slowly **moving east** while gaining altitude.
- JO: The duration of plume generation -- from first appearance to shutdown and plume breakaway -- looks about 42 seconds. Compare this to the pre-flight 'press kit' timeline that specified a 46-second burn. HOW DID YOU MANAGE TO START TAPING BEFORE THE MAIN PLUME EVEN BEGAN?
- G'day Jim! I got my phone out ready to record when I first noticed a "blurry star" that seemed to be gaining altitude. It was a bright dot with a haze around it and it was beginning to rise above the tree line, **I began recording as soon as I noticed the plume.**



OTHER WITNESSES

- ALL-SKY CAMERAS – NONE KNOWN [ANY HELP??]
- ISS CREW – NO OPPORTUNITY
- OTHER SPACE-BASED IMAGERS – NONE KNOWN [ANY HELP??]
- AIRCRAFT CREW REPORTS – NONE KNOWN [ANY HELP??]
- MARITIME CREW REPORTS – NONE KNOWN [ANY HELP??]
- DASHCAMs – NONE KNOWN
 - Dashcams are PARTICULARLY valuable for serendipitous plume observations because they are already recording and thus can capture the very beginning of the event, and also can display azimuth/time, and if road is identifiable, precise direction/elevation

International Space Station	position	3:01 pm UTC Sunday, December 23, 2018
-----------------------------	----------	--

WHO ELSE MIGHT
HAVE SEEN IT??

WHERE WAS THE
INTERNATIONAL
SPACE STATION?

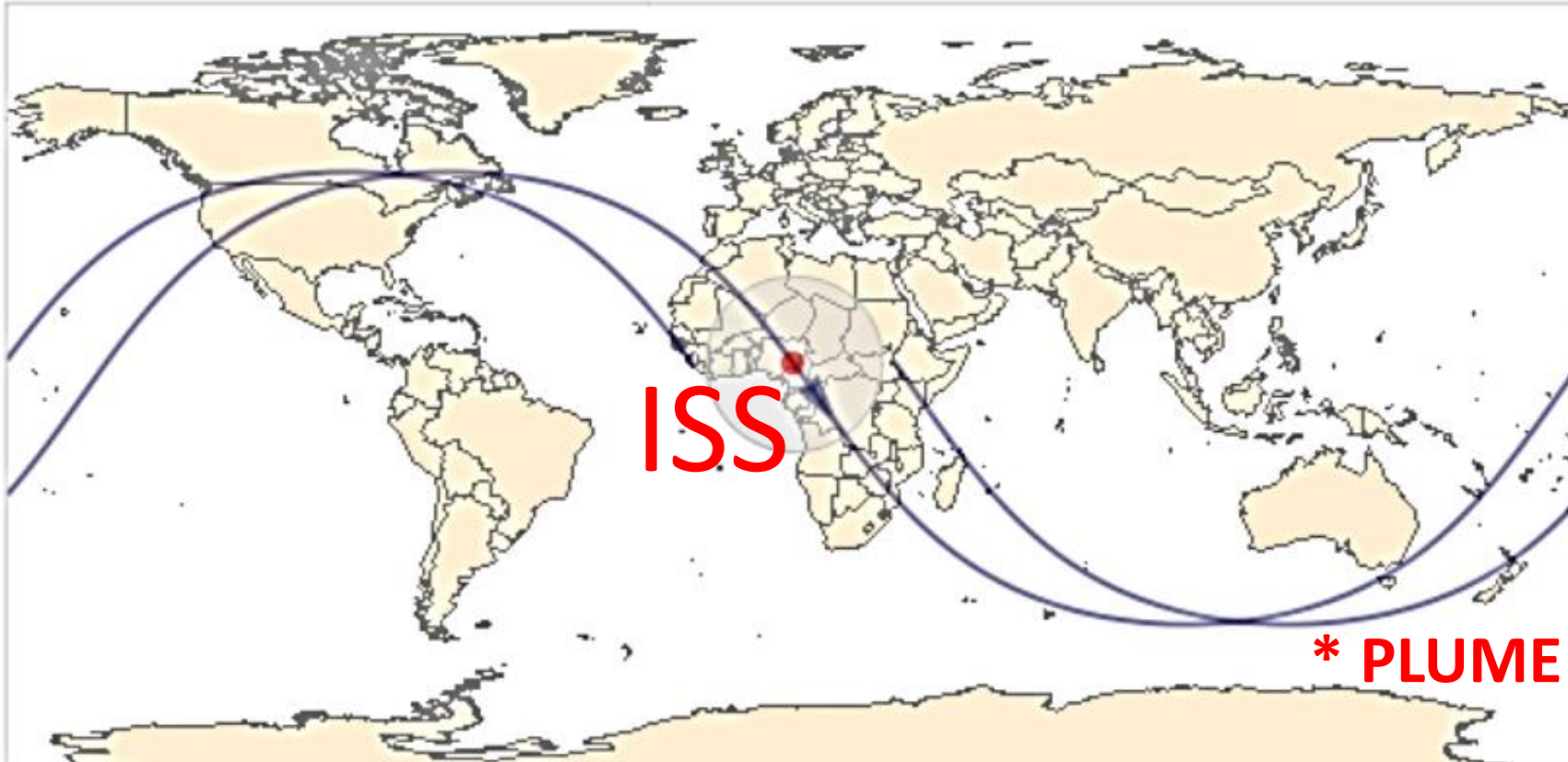
At the time of the burn, the station was over western Africa. The crew's work day is on GMT so for them it was midafternoon but they had no viewing chance.

www.wolframalpha.com

results:

Show DMS

Show



STARFIELD ANALYSIS

- Occasionally, plume images include recognizable starfields
- Image digital manipulation can sometimes show recognizable stars
- More often, moon may appear in field-of-view
- Less useful, if only a few visible brightest celestial objects can be seen, they still MAY provide consistency with an image's claimed origin
- Examples are provided here: TBS
- Identification of star/moon background provides
 - Azimuth/elevation to plume
 - Angular scale of plume
 - Validation or invalidation of images of doubtful origin
 - Calibration of witness verbal descriptions

Wendy Badenhorst Gouws == December 23 at 4:18 PM

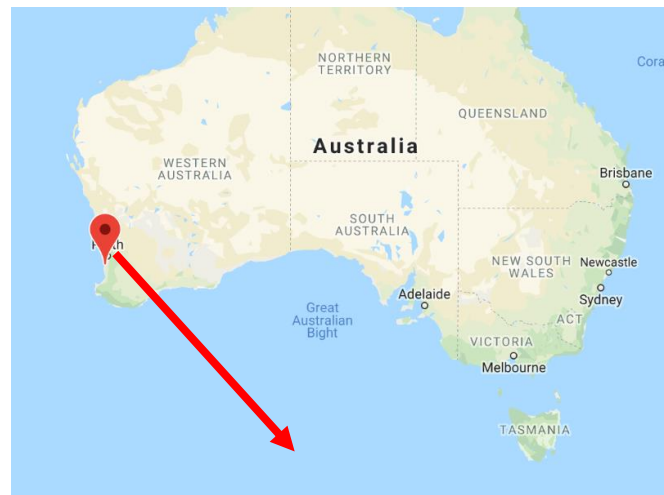
<https://www.facebook.com/groups/AustralianMeteorReports/permalink/1011376052399706/>

We saw this last night in mandurah..it started off as a blurred star. looked **like a cloud in front of the star.** (which was weird . no clouds in sky and all other stars bright), a sudden fireball.. it was amazing to watch.... I captured this photo in Western Australia.. It captured our attention because the star looked different from the others.. **hazed**, like a cloud is in front of it. All other stars were bright. Then suddenly the fire ball....

<https://www.facebook.com/photo.php?fbid=10156521365068283&set=pcb.1011376052399706&type=3&theater&ifg=1>

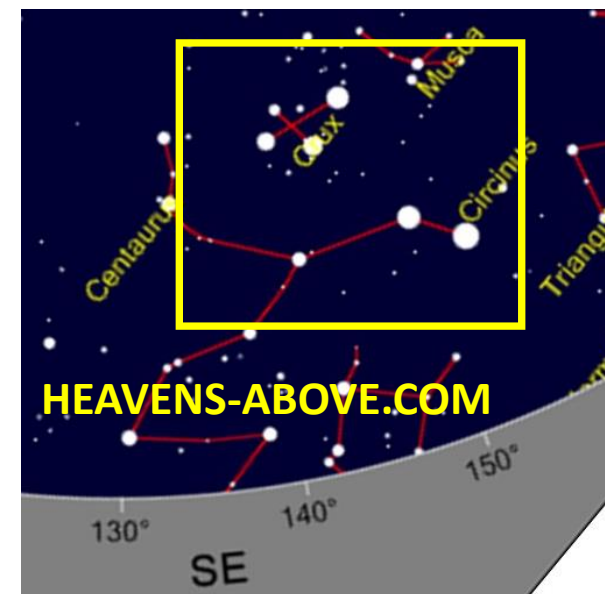
GOUWS

GOUWS



**OBSERVED FROM NEAR
PERTH, LOOKING TO THE
SOUTHEAST. TRIPLET IS
CRUX CONSTELLATION.
BRIGHT STAR AT LOWER
RIGHT IS α -CENTAURI**

OVERBRIGHT



<https://www.facebook.com/photo.php?fbid=10156521365123283&set=pcb.1011376052399706&type=3&theater&ifg=1>


Zane Carney December 23 at 12:51 PM

<https://www.facebook.com/groups/AustralianMeteorReports/permalink/1011261795744465/>

Not a meteor, Falcon 9 satellite launch? I took these images at 02:02 this morning in Anglesea, Victoria. Object/s observed directly south, travelling east at a rate comparable to a slow/med moving satellite. I observed **a leading white orb which was followed by 2 brighter parallel orbs. A parachute-like trail followed these objects, the trail was divided into several parallel sections** which had the appearance of noctilucent clouds. Images are brightened and contrast altered to highlight detail. [JO: NEXT PAGE]

Grahame Kelaheer == Seen from WA also, suspect it was the SpaceX falcon 9 launch indeed!



A night sky with a rocket launch trail and stars. The trail is a bright white line that curves upwards from the bottom right towards the top center. Several bright stars are visible in the dark blue sky. In the bottom left, there are some yellow lights and dark silhouettes of trees or structures.

02:02:40

https://scontent.fhou1-1.fna.fbcdn.net/v/t1.0-9/48402970_2887776421236215_5229693239220502528_o.jpg?_nc_cat=110&_nc_ht=scontent.fhou1-1.fna&oh=1a830a017f856ba0124c6ee19ec8492e&oe=5CC9286A

Carney-1



02:02:49

Carney-2

02:03:04

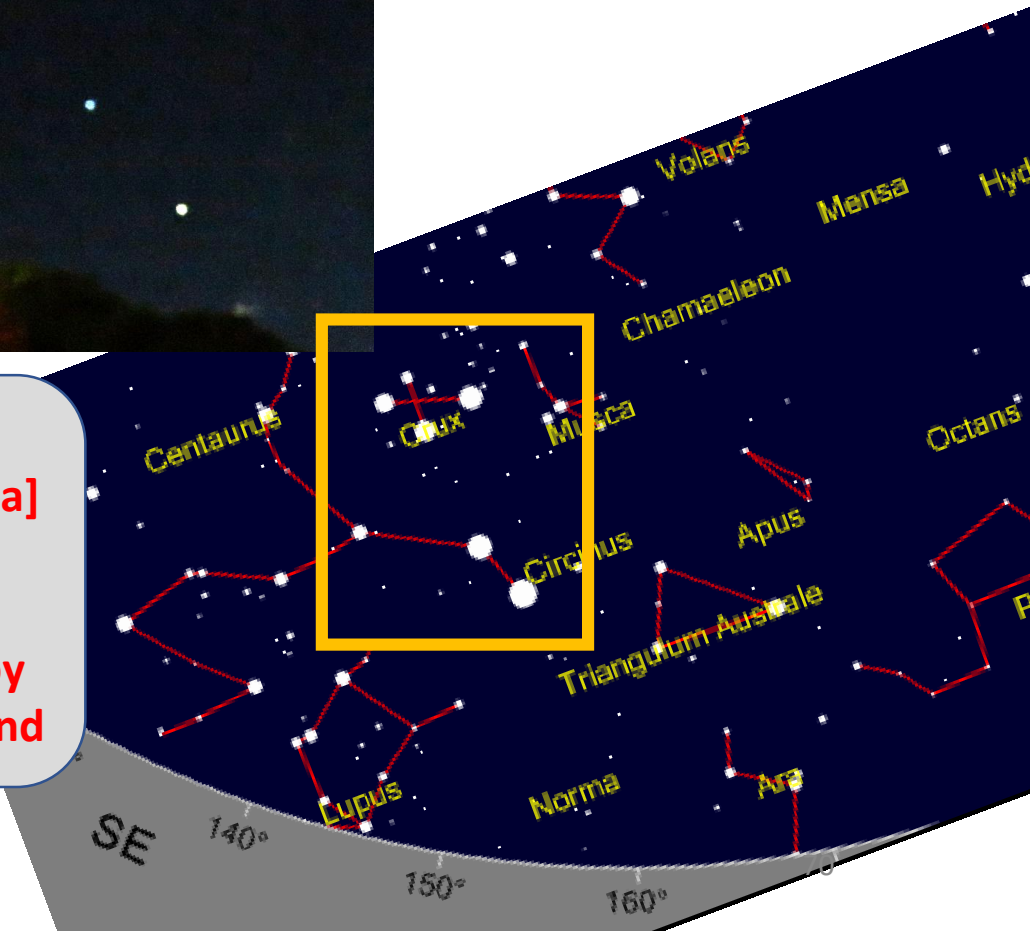
Carney-3



IDENTIFIABLE
BACKGROUND
STARFIELD

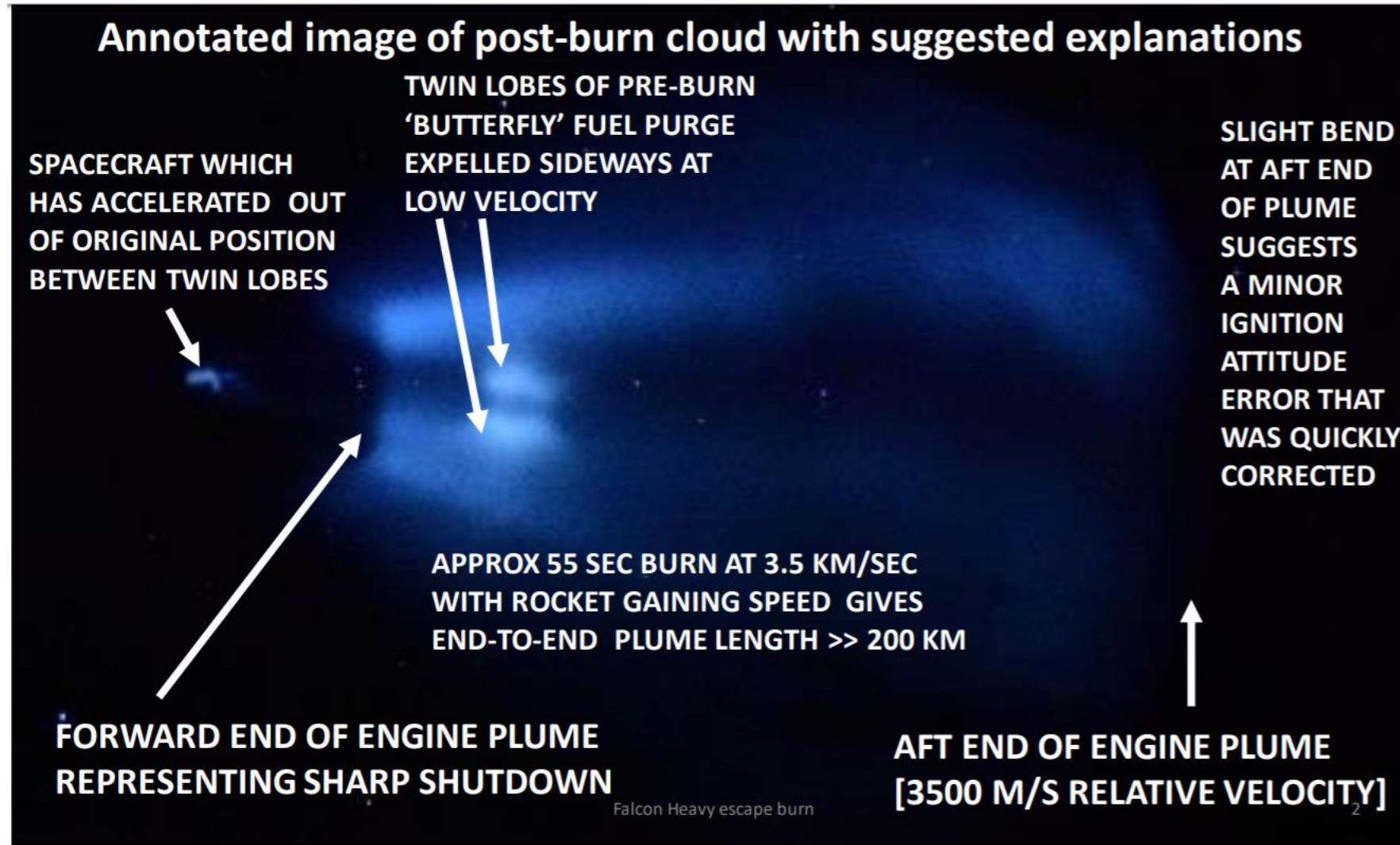
Observed from
Anglesea [SE Australia]
“directly south” in
observer’s words,
~160° is confirmed by
known star background

FALCON9 BURN of DEC 23, 2018



RECAPITULATE – WHAT WAS SEEN VS PERCEIVED

TO RECAPITULATE: THE ONLY PREVIOUSLY-DOCUMENTED FALCON-9 LARGE POSIGRADE BURN WAS ON FEB 6, 2018, HERE IS MY IMAGE INTERPRETATION:



MOST PLUMES FROM FALCON9 MISSIONS ARE NON-PROPULSIVE VENTS OR VERY SHORT [2-3 SEC] DEORBIT BURNS [INTO ATMOSPHERE] FACING FORWARD BUT BOTH THESE EVENTS INVOLVED MUCH LONGER AFT-AIMED BURNS [40-60 SECONDS] TO REACH HIGHER INTO SPACE. THE DESIGN FACTORS [ALTITUDE, TIME, DURATION] AND SUN ILLUMINATION VARY WIDELY FOR MISSION NEEDS.

**VIEWED IN SW BACKLIT
BY OVER-HORIZON SUN
SOON AFTER SUNSET**

**2018FEB06
CALIFORNIA**

**STRIKING SIMILARITIES BETWEEN
STAGE 2 LONG POSIGRADE BURN
POST-SHUTDOWN PLUME SEPARATION,
2018FEB06 CALIFORNIA [TOP] and
2018DEC23 AUSTRALIA [BOTTOM]
[viewing angle similarly off to side]**

**STAGE2 DOING
POSTBURN PURGE
MOVING AHEAD**

DIRECTION OF MOTION

**END OF EXHAUST
PLUME MOVING
RAPIDLY AFT**

**PRE-BURN TWIN
CONDITIONING
UP/DOWN PURGE**

**2018DEC23
AUSTRALIA**

DIRECTION OF MOTION

**CONDITIONING PURGE IS
SYMMETRIC SO DISTURBING
TORQUES WILL CANCEL OUT**

**VIEWED IN SOUTH BACKLIT
BY OVER-HORIZON SUN
NEAR SUMMER SOLSTICE**

IDENTICAL VISIBLE BURN EVENTS:

1. PRE-IGNITION, CRYO PROPELLANT PUMPED INTO ENGINE LINES AND THEN VENTED SYMMETRICALLY UP/DOWN, SLOWLY SPREADING ['BUTTERFLY' OR 'BOW TIE' FORM]
2. IGNITION BEGINS GENERATING FAST-DEPARTING AFT PLUME
3. SPACECRAFT MOVES AHEAD OF STILL-DEPARTING TWIN PURGES SHUTDOWN, SHARP BOUNDED ENGINE PLUME RAPIDLY MOVES AFT, PASSING STILL-FADING PLUMES
4. SPACECRAFT MORE QUICKLY MOVES FORWARD AHEAD OF CONSTANT-SPEED PURGE PLUMES

Ufo over Clifton Hill, Melbourne 24 December 2018 2.00am (looking south)



Maty69r Uploaded on Apr 29, 2019

This video was taken at night with a s8+. The quality is poor and i missed filming most of what i saw. I also only filmed 30 seconds because I was disappointed in how little I could see on my phone at the time.



I would not have posted this if not for finding another video of the same thing posted by a different channel. This is the description of what I had seen prior to filming.

I first saw this bright light moving north (along hoddle st) towards me, I saw it get bigger and brighter as it approached. At the time I thought it was a police helicopter with its spotlight on pointing forward.

MORE →

JO: CASE STUDY IN MISINTERPRETATION

https://youtu.be/m5Cw8_5KocQ

▶ ▶| 🔊 0:01 / 0:31



Ufo over Clifton Hill, Melbourne 24 Dec 2018 2.00am (looking south)

- Then the light dimmed and **the object changed direction east** (eastern fwy/Johnston st) after a few seconds an extremely **bright triangle of light appeared behind it, like a spotlight** in a theater. It was a cloudless night, but **this "beam" produced its own cloud out of the air, it was not coming from the object like exhaust gas.** What was strange was that this cloud **traveled along with**, and at the same velocity as object, **instead of away** like I would expect.
- That's when I realised I had no answers for what this was and went to get my dslr camera, unable to find it quickly I got my phone instead. By the time I got my phone from inside and started filming **the light had gone**, but the cloud behind **was still glowing**, although slowly fading away.
- The object continued to travel **east, without any lights. I could see just some of the moonlight reflecting off its surface, it looked a copper/gold colour. It was pill shaped and vertically orientated.**
- I obviously can't be sure but **the object appeared to be small (car sized) and flying at low altitude.** I **determined this** by its movement relative to me and **the type and behavior of the cloud it produced** It was not a helicopter, it produced no rotor noise and was shaped differently (no tail) **It was not a rocket because it changed direction 90 degrees suddenly, and without impulse.** It moved slow, steady and silent. First north, then East until I could not see it anymore.

JimO comments on Maty69r

[Joined Jul 7, 2006] Melbourne, Australia
<https://www.youtube.com/channel/UCr9rX440XMHjfgfOpr50vkw>



Maty69r's detailed description [THANK you!!] illustrates perfectly the kinds of fully innocent misinterpretations that sharp-eyed, intelligent, sane, sober witnesses can make when suddenly faced with once-in-a-lifetime weird apparitions.

- “I first saw this bright light moving north towards me, I saw it get bigger and brighter as it approached.” Using size as indicator of distance can be misleading when the size is variable [like rocket plume]
- “An extremely bright triangle of light appeared behind it, like a spotlight...” The analogy of a ‘spotlight’ is very common for a rocket plume.
- “this cloud traveled along with [the object]...” Excellent observation
- “the cloud behind was still glowing..” Not realizing how high it was, possibility of sunlit object at midnight was overlooked
- “I could see just some of the moonlight reflecting of its surface” Imagining image of discrete dark object with lit segments is common effect of lights
- “The object appeared to be small (car sized) and flying at low altitude.” Estimates of range to an unknown-sized object are just wild guesses unless an apparent similarity to a familiar object [car] impersonates knowledge



UFO RECORDED OVER SOUTH AUSTRALIA | VIDEO



A strange, oddly-shaped light, spotted in the early hours of Monday morning has left people across the state scratching their heads. So what was it?

A strange, oddly-shaped light, spotted in the early hours of Monday morning, has got heads scratching across the state.

... readers have reported seeing the UFO around 1.30am from across the city and as far afield as Karkoo on the Eyre Peninsula.

By Greg Barila
www.news.com.au
12-24-18

UFORIA

readers have reported seeing the UFO around 1.30am from across the city and as far afield as Karkoo on the Eyre Peninsula.

Reader Dylan Hooper saw the object while driving home from Ceduna.

“It was seriously bright,” Mr Hooper said.

“Originally thought it was the moon behind a cloud.

“It didn’t do anything special, just faded after five minutes.”

<https://www.theufochronicles.com/2018/12/ufo-recorded-over-south-australia-video.html>

ufo over Melbourne!!! 24 Dec 2018 approx 2.00am

<https://youtu.be/LwJaNaxoDuU>

- Hayden Charles // Dec 23, 2018 // or **maybe a rocket launch from... Antarctica?** here's my less hysterical description of what I can see, and where we are looking, returning to shoot video after taking some still shots of the "tail" (all on my Samsung s9 phone btw, sucks to be a photographer without a camera...)
- Hayden Charles == hang on, **how does a rocket get launched from the northern hemisphere but come towards me from the South, then head due East??** It never flew over my head so it hasn't come from that way either... this is fishy ... I can't work out how it gets up in the sky to the South of me after being launched apparently from Florida. My seeing it at 2am would be possibly throwing spanners at it too
- S. Mead == Could be a SpaceX second stage de fueling. Launch was at 8:51am EST 12/23/18
- Hayden Charles == I dunno man, are you counting your hours back using the sun as the reference point? **because this travelled the other way, which means that thing has to go around the whole back side before getting to me**, and that puts your time zone maths into doubt, doesn't it? yeah, please do look into it, because this is actually quite a bit more fishy than i realised...it cant be the spacex rocket that a couple of people say, **the numbers don't work**

UFO Sighting Guestbook



The Guestbook page is for the posting UFO sightings and related events.

This is an alternative, Report UFO Sightings, where you can submit a more detailed report and attach a file, an image or document.

For UFO reports, if applicable, please include, estimated size (say relative to the moon or a star), estimated distance, colour, shape, duration of sighting and number of witnesses.

<http://www.ufo.asn.au/sightings/ufo-sightings-reports-guestbook/>

Emma from Adelaide wrote
on 24 Dec 2018 at 2:33 am:

At 1:29 am on December the 24th I was driving home from the gym and a hazy glowing ball of light travelling smoothly across the sky over Bellevue Heights caught my eye. I sat and watched it and noticed there were not flashing lights like a plane and it looked strange to me. All of a sudden it started emitting **a glowing white trail in a cone shape behind it** that kept **spreading** wider and wider. After **about 30 seconds** the trail cut off and the centre ball continued moving east across the sky. The trail afterwards left behind **a smoky mark in the sky which looked like one big circle and one smaller circle**. I eventually lost track of the moving light as it went behind some trees but I was stunned for quite some time after. Very, very strange. I'm wondering if anybody else saw this?

<https://www.news.com.au/technology/science/space/strange-unidentified-light-seen-over-south-australia/news-story/12f1ebe06f3174dfc2231f19b62e5a46>



DECEMBER 24, 2018 3:52PM

[National](#) | [World](#) | [Lifestyle](#) | [Travel](#) | [Entertainment](#) | [Technology](#) | [Finance](#) | [Sport](#)



A strange, oddly-shaped light, spotted in the early hours of Monday morning has left people across the state scratching their heads. So what was it?

Several Advertiser.com.au readers have reported seeing the UFO around 1.30am from across the city and as far afield as Karkoo on the Eyre Peninsula.

Reader Dylan Hooper saw the object while driving home from Ceduna. "It was seriously bright," Mr Hooper said. "**Originally thought it was the moon behind a cloud. It didn't do anything special, just faded after five minutes.**"

Writing on [The Advertiser Facebook page](#), Rob Sanchez wrote "Saw it! Bright white light with small object moving away from it. Then disappeared."

science ➤ space

Strange, unidentified light seen over South Australia

Melbourne ufo that just entered earth's atmosphere - *or rocket which just left?

<https://youtu.be/nsCRHwI61kl>

- VIDEO BRIEFLY SHOWS DANCING DOT IN LOWER RIGHT CORNER, THEN ENTIRELY BLANK FOR REMAINDER OF SEQUENCE
- TRANSCRIPT: “Back to recording. Recording. Can we see it? Can't see a lot now. I can still see it, so describing what's going on. **There's like a fuzzy cloud out the back of something moving quite slowly, like slower then if -- like the International Space Station was going over.** Oh, now, at the moment I am looking due south and the object is traveling from west to east, and I presume it would be over like -- no I wouldn't have the vaguest idea -- like it could be over Bentley, or it could be over, like -- I know Westernport, could be further. Who knows, it almost seems like **it's maybe pulsing now.** I'll take some more photos. “
- Hayden Charles [Dec 23, 2018] == the photos show much clearer the amazing "tail" left by this flying object of unknown origin (to me at this time). i will try to put another video together and add all the footage i was able to get via my S9 phone. ... [Jan03 response] yeah, I was only using my phone so it couldn't pick it up i guess. thought i should give a description of where i was and what i could see without all the swearing in the previous video
- JO: It's important to record it all -- first impressions and fast reactions, as well a more temperate soon-after recollections. I wish more folks were as observant and as responsive as you were, well done



UFO? 24 DECEMBER at 2.05
am near Melbourne airport.
<https://youtu.be/rQppJWXTyQI>



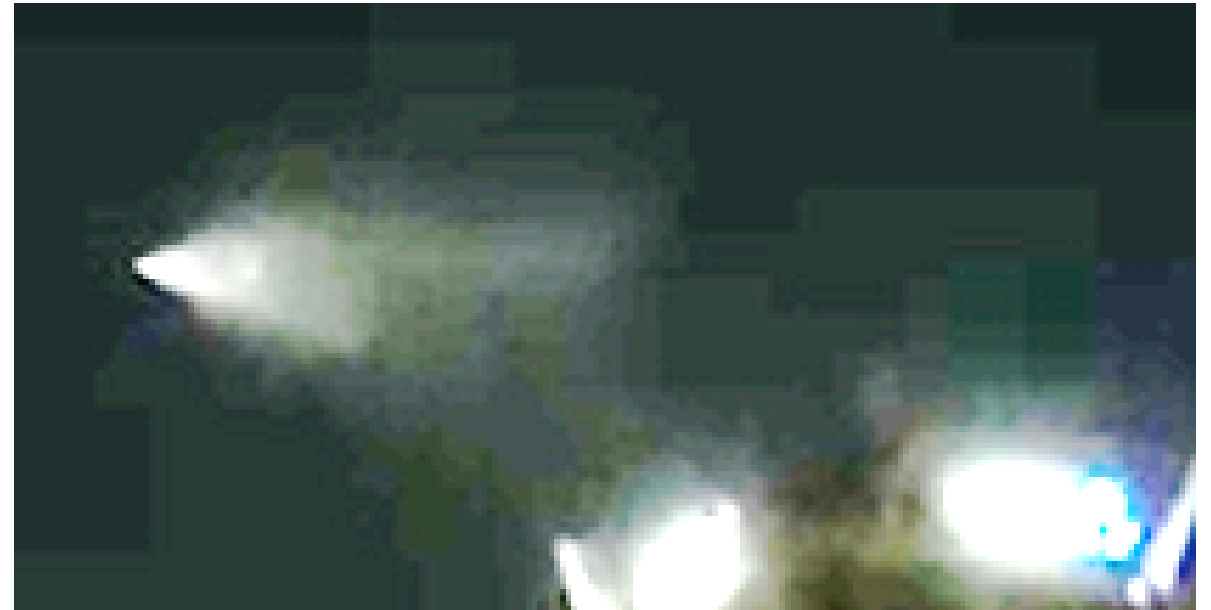
NO TEXT IN ORIGINAL POST

RESPONDED TO QUERY:

“Moving slowly without any noise, as you can see **the light was emitting looked like a torch [JO: britspeak for ‘flashlight’], and the front of it had light.** Notice the star when it passed by it. It wasn't a plane or a helicopter because no other lights as the planes or helicopters have.”

- Julian BIZDOACA // Published on Dec 27, 2018

'DK': UFO in Melbourne..?!?!?!
<https://youtu.be/bFA4OT0UWlg>



Dec 23: BACKGROUND
VIEWER COMMENTS BUT NO
OTHER DESCRIPTION

04/30/2019

FALCON9 BURN of DEC 23, 2018



UFO sighting over Melbourne

<https://youtu.be/3aky4Ew0HkM>

- Gerry Polites
- Dec 23, 2018
Christmas eve
- Ryan Williams ==
Awesome
someone did get
it on film

UFO / ET Craft over Australia 24th - Dec 2018

Peter Maxwell Slattery // Dec 25, 2018 // 2,033 views



- **ECETI Australia**
- Slattery == UFO / ET Craft over Mount Beauty Victoria Australia on the 24th of December 2018 filmed by Peter Maxwell Slattery..
- Comments are disabled for this video.
- petermaxwellslattery@outlook.com.au
- <https://youtu.be/u9FDjqleQZc>

The aim of ECETI (Enlightened Contact with Extra Terrestrial Intelligence) Australia is to help with public awareness of the E.T reality, and to help and assist people with connecting to positive otherworldly beings. ... [He offers] full spectrum ambassador training in proper context of ETs and other dimensions through the path of Self Mastery as well as the chance to have a one-on-one opportunity with one of the most qualified individuals in the field, Peter!

A.U.F.O.A - Australian UFO Action

<https://www.facebook.com/AUFOA>



No mention.....

UFOCUS NZ director Suzanne Hansen -- no responses



UFO Australia
@marani55

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UFO Australia
 December 24 at 3:23 PM · 🌐

<https://www.adelaidenow.com.au/.../ccb12971569f35c026edb17a15...>



ADELAIDENOW.COM.AU

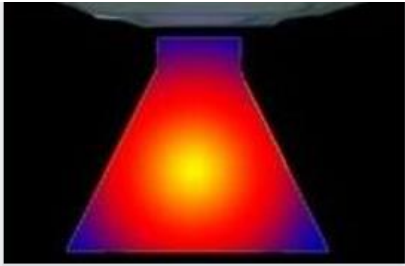
Santa or SpaceX? Weird light spotted over SA

A strange, oddly-shaped light, spotted in the early hours of Monday...

11
 2 Shares

AUSSIE UFO
WEBSITES
MOSTLY GOT
THE STORY
CORRECT

https://www.facebook.com/marani55/posts/2398064243546559?_xts__%5B0%5D=68.ARAr-PFpv1uf3UzLY8qxqE6sqGOWtWcUR_4AdMDreoSWqQ3ScrSUJpZqCX4zOS8mvq5Dgcc3bxtkhhkhBV7UoHd3NRd3PxcBiRQ7yD5WmrAiH665QyjmDn9osWZXdlkZl3Z2Bqghadtg0VE3cCCu-2F-Jgr747z-l2amjxKQxjXK0SB52ZllyWhHW7aVI4zRC4nXyKDuhqFBN5s6D0BhRT9iPBSarMEGQdD0WKAVNixOVDY7GGsXPnhLpLeLaWu68vK3mxxrcno54XyS_SQMfBHhftldlVwg14k84l9zRnwvox5G5KXacRMMWLWw8pApwzzNzpg7Ndt5eQ5lf5OnN5lwPw&__tn__=-R



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Queensland Inc

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December 25 at 4:32 PM · 🌐

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Santa or SpaceX? Weird light spotted over SA

A strange, oddly-shaped light, spotted in the early hours of Monday...

Jason Templeton
== One of the only
joys working night
shift is being able
to see things lie
this. It certainly
looked very
impressive.

Dalakis Bernadette
== Me and my
friend seen exact
same thing!

https://l.facebook.com/l.php?u=https%3A%2F%2Fwww.adelaidenow.com.au%2Fnews%2Fsouth-australia%2Fsanta-or-spacex-south-australians-report-weird-object-in-the-early-hours-of-christmas-eve%2Fnews-story%2Fccb12971569f35c026edb17a15a636c5%3Ffbclid%3DIwAR03xAGBRZSTDrX388PbstTMDpoulllaSYszMrMTGmhRDPKwBCz4dfsik&h=AT1L_SHdDveixXnQKJ457YoygizQ78w1pdczakKtNLA4jFSZ5vssKwNSC3hx64IviNSqMutFTS5TyWZ8Xjdau7XFK_fxdhHHSXkdA44KWAVuriokScxvXJSwRTRtk71p75bOveOGS-zJEbE5TAuiNSMMIXGjY-PuLJbz-9AnFvNyNTDWSPNkg2IOLQK8bjQJPiezULMzeG_eufWhxXdASitXPqPBKk7WccjjooXzcr-yCZQFOYlxDgzJ2acFUV5xEcu3_htRC_xXBIfivjkmKxawmVsZJARY2DW1SYk0uGknbgMUaBVBk8ZFyiolNYBLNsgRO0ojYA91EbwdbeB1LwsgITArxYF85hWKeZhBEVhEgo-efZEvcaOlXy_a_wWYVzCBL0THaC2Y6kt31IKAJRzMTGkQJO_ObhAiiwVngC-K-DeQonHGGrjhlwAgbqlZxUzksGtv_qkZRSuRceVfekg8RE7A6Xhpxcfe3x3zqlvYVuwCZ6qcwjtQ43leNk_aQC3wFzjXnYw668KEVBf9GSPSnZvk0R13YN8APfIUe4WI058CCEnXQuuqZModVQRB7YGvaMqT6872UaG6SBq38E0iIFMoUDf7ZauE0y6FZd0o-cGE0wy3

DEORBIT – WHEN AND HOW AND WHO MIGHT HAVE SEEN IT?

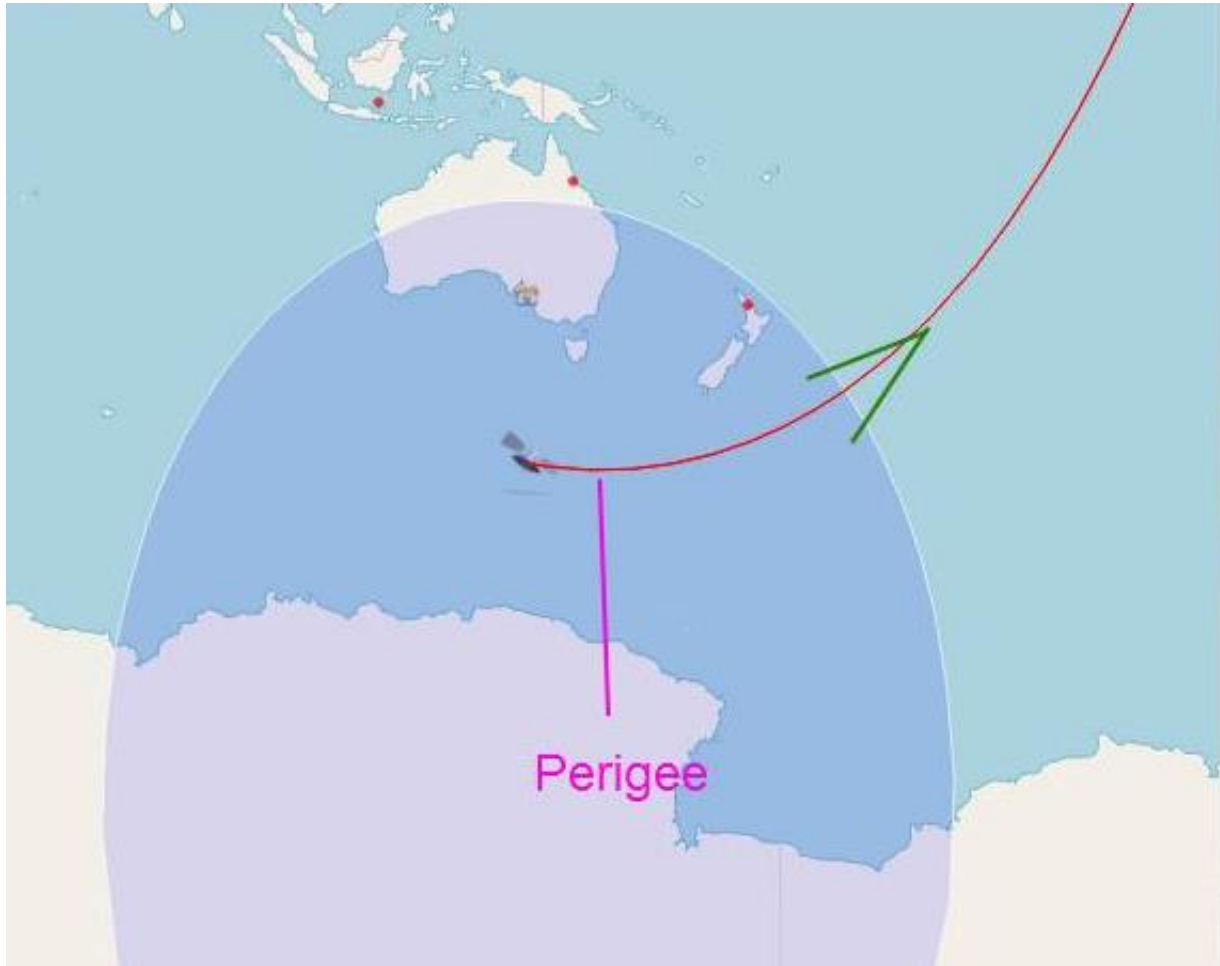
- 1 TBD
- 2
- 3
- 4

Deorbit burn – WHEN?

trans-GTO burn

01:08:51

46 seconds



Int'l Code: 2018-109A ⓘ

Perigee: 1,198.7 km ⓘ

Apogee: 20,205.8 km ⓘ

Inclination: 55.0 ° ⓘ

Period: 370.0 minutes ⓘ

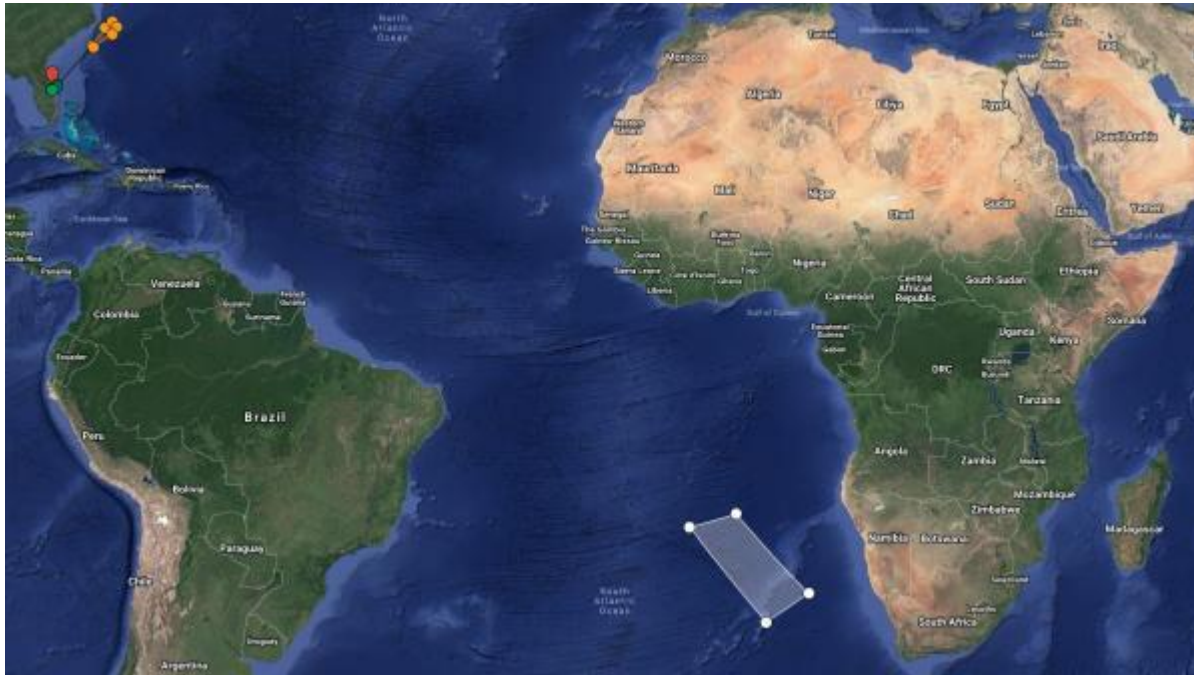
Semi major axis: 17073 km ⓘ

https://scontent.fhou1-2.fna.fbcdn.net/v/t1.0-9/49419764_2307326602634948_6693109642031005696_o.jpg?_nc_cat=108&_nc_ht=scontent.fhou1-2.fna&oh=abdd448891d699288e2133dbba1daac4&oe=5C9A5ECC

Prelaunch warning message of Stage-2 deorbit region.

Eastern South Atlantic NOTMAR space debris area for upper stage of this mission.

Active in primary and backup launch day in window beginning T+05h44m to T+07h38m.



Please remain clear of the Launch
Hazard Area from 7am – 10:15am

**THIS TIME IS SEVERAL
HOURS AFTER THE
VISIBLE ROCKET BURN
SOUTH OF AUSTRALIA**

<https://forum.nasaspaceflight.com/index.php?action=dlattach;topic=46962.0;attach=1533186;image>

Private space sleuths' discussion on deorbit burn

<https://forum.nasaspaceflight.com/index.php?topic=30912.380>

Jonathan -- Back to the discussion about the S2 deorbit burn: I am skeptical that a further 2 hour coast to apogee before deorbit would be used - I bet they want to finish the thing as soon as possible after payload sep.

Yes, it's less efficient. But if the report that reentry was at T+6h30min is correct, and using the target NOTAM area west of Namibia, I get a much better fit with a 450m/s retrograde burn at about 1600 UTC, just after payload separation, resulting in a -590 x 17570 km deorbit trajectory. Burns of around 180 m/s at apogee instead give entry at T+7h10m further downrange near the Antarctic. But it's quite possible I've done my sums wrong.

Louscheffer == This makes sense - they had plenty of extra performance available. The burns they used (not counting de-orbit) totaled about LEO+2500 m/s. And they had about LEO + 2450 (standard GTO) + 350 (lighter payload) + 350 (expendable) = 3150 m/s available. That's 650 m/s that they could have had with the payload, which translates to about 1090 m/s without the payload (assuming ISP=348, ending mass = 5500 kg (controlled shutdown), sat mass = 4400 kg). So no need for an efficient strategy, and why do an extended coast if not needed?

POSSIBILITY OF DEORBIT BURN VISIBILITY

- 1 open issue
- 2
- 3
- 4

OPEN ITEMS – FURTHER WORK

- Previous missions – search areas below expected plume events, with proper sunlight conditions
- Further inquiries to SpaceX [officially and otherwise] about nature of plume-forming events
- Further application of ‘rocket science’ to generic plume analysis
- Widen public awareness of serious interest in details of any such observations in the future

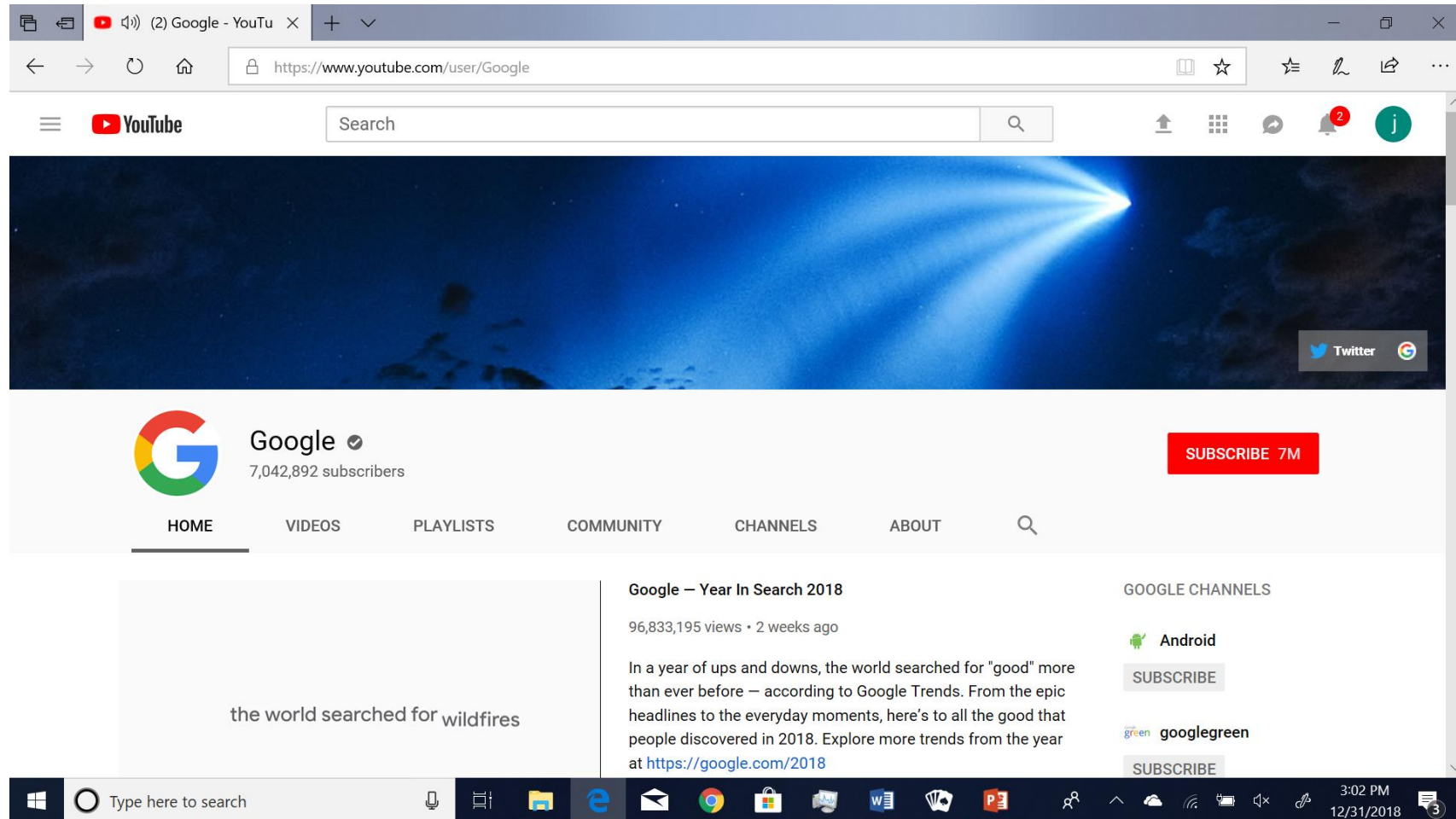
Summary and conclusions

- Amazing no-notice performance of MANY Australian observers
- Common range of misperceptions showed up as usual
- SpaceX policy of no advance release of potentially visible post-launch propulsive events forces researchers to rely on fortuitous accidental observations.
- This is so far the ONLY ground observation of such a transfer burn
- Given launch times of future GEO missions, proper illumination of trans-GEO burn in Gulf of Guinea can be predicted In advance
- This report can inform potential future viewers of the equatorial GTO insertion burns what to expect and how to document any lucky observations

UNUSED SLIDES

- 1
- 2
- 3
- 4
- 5

Google uses SPACEX image in end-of-year promo



Dec 31, 2018

<https://www.youtube.com/user/Google>

Colin Legg == Wendy, here are some previous examples seen from WA. Well done! =

- <https://vimeo.com/154398108>
- Atlas V - GPS IIF-12 satellite deployment == United Launch Alliance Atlas 5 rocket carrying the GPS 2F-12 navigation satellite. Video starts from just after 2nd stage burn with a fuel dump from the Centar upper stage shortly after this. ?? Feb. 5, 2016 ??
- <https://vimeo.com/13998472> [05 Aug 2010 06:04-06:13 WST]
- Spinning Rocket in Space Timelapse == I took this short clip last Thursday morning just before sunrise while finishing off an all night starlapse. At first I thought the object was a comet near Jupiter, but after taking a shot I realized it was moving...although very slowly for a normal satellite. I only got 44 frames before sunrise started to blow things out.... After processing and analyzing the sequence, I realized I'd captured a spinning de-object, probably the spent stage of a rocket sending a satellite to Geosync or extra Earth orbit. The spinning is most obvious in the final 2 scenes, where I tracked the object using After Effects and zoomed to 100%. Things get a little noisy at that level.
- ===== JO REPORT =====
- http://satobs.org/seesat_ref/misc/180314-falcon9s2-australia.pdf
- June 4, 2010 Falcon-9 second stage post-insertion prop venting

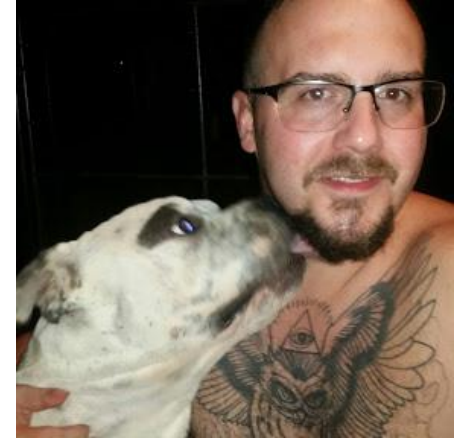
OTHER USE OF SCHAHINGER

- [UFO Recorded Over South Australia | VIDEO – Webstynx Inter](#)
- <https://webstynx.com/ufo-recorded-over-south-australia-video/>
- Dec 26, 2018 - On last night's show Rupe interviewed a surprise special guest, John Lear. John Lear was present in Las Vegas in 1989 when Bob Lazar went ...
- <https://www.theufochronicles.com/2018/12/ufo-recorded-over-south-australia-video.html>
- [UFO Recorded Over South Australia | VIDEO - The UFO Chronicles](#)
- <https://www.theufochronicles.com/2018/.../ufo-recorded-over-south-australia-video.ht...>
-
- Dec 27, 2018 - Readers have reported seeing the UFO around 1.30am from across the city and as far afield as Karkoo on the Eyre Peninsula.

Local expert to contact

- Paul Curnow
- <http://people.unisa.edu.au/paul.curnow>
- Paul.Curnow@unisa.edu.au
- =====
- https://twitter.com/9NewsAdel?ref_src=twsrc%5Etfw
- https://twitter.com/10NewsFirstAdl?ref_src=twsrc%5Etfw
- https://twitter.com/abcadelaide?ref_src=twsrc%5Etfw

[video on unrelated Australian UFO event]
<https://youtu.be/nbKQ9cKSwag>



- Craig Estep [approx. dec 24] == I stood outside and watched this PHENOMENON **for over 5 HOURS** last night!!!! By NO MEANS is this thing a ROCKET!!! It is ORBITING EARTH!!! I also witnessed shooting stars going all around it. The strangest part was **the single light beam that went up and forked out into two beams...** which at times would go away and then return. It looked as though it was "morphing" into different shapes. When I looked at it with a pair of binoculars (yeah, no telescope here... YET) I saw a **cluster of 3 circles** (which possibly could have possibly been the reason for the "morphing" effect that I saw. Who knows?! That dude can go sit down on a rocket... it may clean out a little of that bulls**t that he just said to cover up WHATEVER "organization" he is representing...
- [more than 45 people of that name on Facebook]
- JO: "that dude" seems to refer to my earlier post of my report explaining the "Australia fuel vent spiral June 4, 2010" as the first Falcon9 orbital test.

UFO Mundaring Perth

https://youtu.be/CueJtu_NNIs

**UNRELATED
COINCIDENTAL
OBSERVATION**

- Peter Hallmen == Dec 23, 2018 == 23 December 2018 at 3:12am on the Great Eastern Highway just after Mundaring. There were Two of these but the other object was identical to others I seen weeks ago. They were not close to each other, my guess would be 5km apart. This one is a little different to the other ones I've seen as the shape is actually a square, but my camera is picking up a hexagon shape. It's also interesting that there is a black centre and it appears to be spinning. It actually seems to be morphing as well. This video isn't the same as I seen with the naked I. It was clear as day light. There is another video I seen on Utube which is exactly what I was looking at. The light is as bright as a star but was very obvious to be a square.
- [reply] jim oberg this is on the 'great eastern highway' ... facing EAST. Towards Kalgoorlie. Between 2am - 5am. This is light was in a shape of a square. The glare off my camera makes it look like a hexagon. It was too bright to see the innards but not enough to mistake the exact shape. It moved closer towards me as I walked away from it. Once sunrise came, it ascended and disappeared. This was at a slow rate. Nothing during this encounter was quick or sudden. The actual object was just moving very slowly or it would just stay in one spot.
- JO == Thanks!! There were other sightings soon after midnight all the way east to Melbourne and even Hobart, but none near sunrise. They described a triangular object low in the southern sky moving right-to-left. Seems like **these were independent events from yours**. Whatever these turn out to be, the collection of detailed reports by witnesses will contribute to figuring them out, I believe. So THANK YOU.

NON-ASSOCIATED COINCIDENTAL REPORTS?

THERE ISN'T ANY 'SEA' NORTH OF KINGSTON PARK, BUT THE DESCRIPTION VAGUELY FITS. WAS THE WITNESS CONFUSED ON AZIMUTH?



‘Adelaide Now’

Peter == I saw this very clearly from Kingston Park, **due north**. There were two adjacent white light sources almost like the landing lights of a plane, bright enough to show a **clear reflection on the calm sea**.

Michael == Due north? Yep could only be one thing SANTA HAS ARRIVED!! SANTA HAS ARRIVED!!

John == 9.30am over eastern melbourne metropolitan area. First thought was a parachute but it just hung there. Very strange & eerie. **[JO: TYPO ON TIME OR ANOTHER EVENT?]**