

<http://www.af.mil/News/ArticleDisplay/tabid/223/Article/703894/evolution-of-gps-from-desert-storm-to-todays-users.aspx>

I just saw a brief status update for eLoran:

<https://www.linkedin.com/pulse/eloran-korea-status-report-iala-dana-a-goward/>

<https://www.c4isrnet.com/c2-comms/satellites/2018/06/05/air-force-gets-another-payload-to-boost-gps-iii-satellites/>

<https://www.networkworld.com/article/3278592/internet-of-things/for-iot-alternative-location-services-are-better-than-gps.html>

<https://www.linkedin.com/pulse/korea-use-eloran-autonomous-vehicles-drones-dana-a-goward/>

<https://www.linkedin.com/pulse/50000-euro-fines-trucks-jammers-dana-a-goward/>

<http://gpsworld.com/china-to-launch-11-more-beidou-3-satellites-this-year/>

<https://www.linkedin.com/pulse/drone-video-xmitter-disrupts-gps-reception-novatel-case-goward/>

<https://www.linkedin.com/pulse/parked-car-disrupts-gps-reception-novatel-case-study-dana-a-goward/>

<https://www.cnet.com/videos/uber-knows-when-scammers-are-using-gps-spoofing-apps-heres-how/>

<https://www.linkedin.com/pulse/gps-jamming-spoofing-rise-aviation-international-news-goward/>

<http://insidegnss.com/infeasibility-of-multi-frequency-spoofing/>

<https://www.linkedin.com/pulse/deter-attacks-gps-fund-terrestrial-systems-like-eloran-dana-a-goward/>

<https://www.linkedin.com/pulse/problem-gps-modern-military-army-technology-dana-a-goward/>

<https://www.linkedin.com/pulse/qulsar-sees-3-jamming-events-day-near-san-jose-airport-dana-a-goward/>

GPS Jamming Detectors:

http://www.chronos.co.uk/files/pdfs/cs-an/Jammer_leads_to_Arrest.pdf

<https://www.linkedin.com/pulse/drunk-driving-shoplifting-jamming-gps-chronos-case-study-goward/>

GPS Jamming Detectors:

http://www.chronos.co.uk/files/pdfs/cs-an/Jammer_leads_to_Arrest.pdf

<https://www.linkedin.com/pulse/truck-gps-jammers-impact-major-data-center-orolia-dana-a-goward/>

https://spectracom.com/sites/default/files/document-files/Case_Study-GNSS_Interference_Datacenter.pdf

<https://www.linkedin.com/pulse/dhs-holding-another-jam-fest-dana-a-goward/>

[https://www.fbo.gov/index?s=opportunity&mode=form&id=c2c18084c4e75f240a91ba327160bf5e&tab=core&cvie](https://www.fbo.gov/index?s=opportunity&mode=form&id=c2c18084c4e75f240a91ba327160bf5e&tab=core&cview=0)

<https://www.geospatialworld.net/news/waas-joins-geo-5-giving-faa-improved-gps-coverage/>

<https://www.linkedin.com/pulse/timing-electrical-grids-two-views-dana-a-goward/>

<https://outlook.live.com/owa/?path=/mail/inbox/rp>

<https://www.linkedin.com/pulse/design-out-gps-part-mitres-approach-vulnerability-dana-a-goward/>

http://www.atis.org/assured-access/docs/04_Mitre_Betz_TimeRobustnessResilience.pdf

<https://www.linkedin.com/pulse/resilient-gps-small-uas-dhs-request-info-dana-a-goward/>

[https://www.fbo.gov/?s=opportunity&mode=form&tab=core&id=e9706cf1be4b2ed0317b9b0a3bfe806d&cvie=0](https://www.fbo.gov/?s=opportunity&mode=form&tab=core&id=e9706cf1be4b2ed0317b9b0a3bfe806d&cvie)

Spoofing in 2019:

<https://insidegnss.com/petite-new-spoofing-detector-aims-to-protect-gps-gnss-receivers-in-drones-vehicles-even-cell-phones/>

<https://www.gpsworld.com/septentrio-and-sapcorda-to-demonstrate-gnss-positioning-for-autonomous-driving/>

GPSIII in 2019: <https://www.gpsworld.com/gps-iii-finally-aloft-benefits-on-the-way/>

Magnetic Fields potential to switch:

<https://www.inverse.com/article/52392-is-theearths-magnetic-field-going-to-reverse-in-2018>

Fikret Sivrikaya and Bulent Yener, "Time Synchronization in Sensor Networks: A Survey," IEEE Network, Vol. 18, No. 4, pp. 45-50, July/August 2004.

https://www.researchgate.net/publication/3282848 Time_Synchronization_in_Sensor_Networks_A_Survey

Time synchronization is an important issue in multihop ad hoc wireless networks such as sensor networks. Many applications of sensor networks need local clocks of sensor nodes to be synchronized, requiring various degrees of precision. Some intrinsic properties of sensor networks, such as limited resources of energy, storage, computation, and bandwidth, combined with potentially high density of nodes can make traditional synchronization methods unsuitable for these networks; hence, there has been an increasing research focus on designing synchronization algorithms specifically for sensor networks. This article reviews the time synchronization problem and the need for synchronization in sensor networks, then presents, in detail, the basic synchronization methods explicitly designed and proposed for sensor networks.

A. Bletsas, "Evaluation of Kalman filtering for network time keeping," IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency Control, Vol. 52 , No. 9 , pp. 1452 - 1460, Sept. 2005.

Aggelos Bletsas, Andrew Lippman, "Evaluation of Kalman Filtering for Network Time Keeping," IEEE Pervasive Computing and Communication, 2003.

<http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.409.2425&rep=rep1&type=pdf>

<https://www.gpsworld.com/survey-accuracy-the-future-of-precision-with-5-gnss-constellations/>

Recent instability of earth's magnetic North Pole and its adverse effect on navigation:

<https://www.linkedin.com/pulse/earths-magnetic-north-shifting-rapidly-whats-mean-gnss-dana-a-goward/>

https://www.upi.com/Science_News/2019/01/14/Magnetic-Norths-erratic-behavior-forces-update-to-global-navigation-system/1611547434485/

<https://www.electronicsspecifier.com/artificial-intelligence/what-will-be-the-ai-trends-in-2019>

<https://www.gpsworld.com/commentary-high-precision-positioning-is-going-mainstream/>

How Russia resisted a terrorist Drone attack as a SWARM:

<https://www.linkedin.com/pulse/russia-missiles-ew-defeated-drone-swarm-attack-dana-a-goward/>

http://eng.mil.ru/en/news_page/country/more.htm?id=12157872@egNews

<https://www.itnews.com.au/news/australia-to-harden-gps-infrastructure-cyber-defences-518097>

<https://www.gizmotimes.com/what-how/gps-glonass-gps-locking/39>

<https://blog.executivebiz.com/2019/01/raytheon-develops-electronic-warfare-tools-to-shield-usaf-aircraft-units/>

<https://www.linkedin.com/pulse/meet-darpas-glide-breaker-hypersonic-missile-killer-lieberman-/>

<https://www.datasciencecentral.com/profiles/blogs/an-executive-primer-to-deep-learning>

<https://www.labmate-online.com/news/mass-spectrometry-and-spectroscopy/41/breaking-news/how-is-gps-improving-an-introduction-to-gps-iii/48090>

Kaman Aerospace's K-MAX "intermeshing rotors" (the two rotors cross each other) needs no tail rotor and gets more done using less power. Flaps like on an airplane wing are built into each rotor. First helicopter designed and certified for external lift operations.

<https://www.theverge.com/2019/1/20/18188332/space-based-interceptors-icbms-missile-defense-review>

<http://missiledefenseadvocacy.org/alert/we-are-taking-action/>

<https://thebarentsoobserver.com/en/security/2019/01/norway-tired-russian-military-gps-jamming-unacceptable-and-risky>

<https://www.linkedin.com/pulse/norway-protests-regular-russian-jamming-gps-barents-dana-a-goward/>

<https://money.usnews.com/money/blogs/outside-voices-careers/articles/how-to-handle-conflict-in-the-workplace>

<https://www.technologyreview.com/the-download/612293/mit-has-just-announced-a-1-billion-plan-to-create-a-new-college-for-ai/>

<https://www.iaea.org/newscenter/news/natural-radioactivity-in-food-experts-discuss-harmonizing-international-standards>

<https://www.linkedin.com/pulse/crowd-sourcing-jamming-info-82-say-action-needed-inside-goward/>

Map of GPS Control Segment: <https://www.gps.gov/multimedia/images/GPS-control-segment-map.pdf>

GPS External Links: <https://www.gps.gov/support/links/>

Frequently Asked Questions: <https://www.gps.gov/support/faq/>

Satellite Navigation: <https://www.explainthatstuff.com/howgpsworks.html>

Live Map of Satellite Positions: https://in-the-sky.org/satmap_worldmap.php

GPS Satellite Pictures, Images, and Stock Photos: <https://www.istockphoto.com/photos/gps-satellite?mediatype=photography&page=33&phrase=gps%20satellite&sort=mostpopular>

Navstar: GPS Satellite Network: <https://www.space.com/19794-navstar.html>

GPS Image Address: <https://upload.wikimedia.org/wikipedia/commons/2/27/GPS24goldenSML.gif>

<https://insidegnss.com/gnss-technologists-continue-to-impact-industry-developments-policies/>

Concerned with Department of Homeland Security (DHS) Cybersecurity of GPS/GNSS:

<https://www.linkedin.com/pulse/government-advisor-dhs-behind-curve-protecting-gps-from-goward/>

<https://insidecybersecurity.com/share/9486>

2019 Missile Defense Review updates the last one (2010):

<https://news.clearancejobs.com/2019/01/21/missile-defense-review-sets-up-a-space-based-showdown/>

The above claims space-based system is the key to successful mid-course interception (but everyone expects heavy opposition to this claim).

<https://www.linkedin.com/pulse/silicon-based-electro-optical-gyroscope-overcomes-snr-lieberman-/>

Air Force selects Harris Corporation as PNT prime in Jan 2019:

<https://www.linkedin.com/pulse/air-force-selects-harris-corp-prime-contractor-pnt-lieberman-/>

<https://www.gpsworld.com/air-force-selects-harris-corp-as-prime-contractor-for-nts-3/>

More on Earth's recent crazy acting magnetic fields:

<https://www.nature.com/articles/d41586-019-00007-1>

How to avoid a PNT Zombie Apocalypse: "GNSS-From A Single Point of Failure to Multiple Points of Success." <https://www.linkedin.com/pulse/how-avoid-pnt-zombie-apocalypse-dana-a-goward/>

<https://rntfnd.org/wp-content/uploads/Goward-ITM-Talk.pdf>

Australia is helping the Chinese to develop their Navigation Satellite System that directly competes with our GPS: <https://www.smh.com.au/politics/federal/australia-helping-china-develop-its-rival-system-to-american-gps-20190128-p50u4m.html>

GNSS Receivers - Evolution or Revolution: <https://www.gim-international.com/content/article/gnss-receivers-evolution-or-revolution>

How does the Hubble Telescope Orient itself in space? <https://www.linkedin.com/pulse/hubblecast-114-how-does-hubble-orientate-itself-space-lieberman--1e/>

<https://www.spacetelescope.org/videos/hubblecast114a/>

<https://news.stanford.edu/2019/02/01/stanford-spurs-ai-navigation-space-rendezvous-software/>

Quiet light: <https://www.news.ucsb.edu/2019/019332/quiet-light>

New SSN-790 Fast Attack submarine commissioned: <https://www.navalnews.com/news/2019/02/block-iii-virginia-class-submarine-uss-south-dakota-ssn-790-commissioned-in-the-u-s-navy/>

The Earth's magnetic North just changed and here is what it means:

<https://www.msn.com/en-us/news/technology/magnetic-north-just-changed-heres-what-that-means/ar-BBTb3iR?li=BBnb7Kz&ocid=mailsignout>

Royal Institute of Navigation's Resilient PNT Portal:

https://www.gpsworld.com/royal-institute-of-navigation-launches-resilient-pnt-portal/?utm_source=gps_navigate&utm_medium=email&utm_campaign=gps_navigate_02052019

<https://rin.org.uk/page/ResilientPNT>

Elmer Croan 2nd degree connection2ndFounder at Save LORAN Foundation

Marco, I struggled with trying to find a way the Earth's N. Pole would affect the GPS Satellites and I think I found one possible way although very unlikely. If the movement of the pole affected the actual magnetic field and allowed "another Carrington event" due to a weakened field that could be one way due to loss of orbital assets. The other way is that, since GPS Satellites rely on Atomic Clocks, if the pole shifting somehow caused enough localized variation in Einstein's theories of both General, and Special Relativity that would cause only either the surface or the orbital plane to be affected, but not both at the same time then there would be an unacceptable "delta" between the two elements of any GNSS system that would cause the crucial Time Difference Of Arrival or TDOA calculation to be incorrect thus causing an incorrect location to be determined from it as a consequence. So short of anything causing a tear in the fabric of Space Time, or a physical loss of satellites this above mentioned article is just fear mongering. I hope everyone who read the above understood it was just a silly example of how inaccurate the journalism was in the original article.

Elmer Croan 2nd degree connection2ndFounder at Save LORAN Foundation

Marco, that's a very good point. It is also a sad state of the quality of technical journalism that has become very common today. I have warned lots of people about just reprinting an article without first checking to see if it is valid or true. I might be wrong but the only

thing I believe this impacted was the printing of new charts with updated "local deviation" adjustments that one sees on paper charts that show this effect by depicting a compass inside another compass showing the offset observed for that particular chart coverage.

http://www.esa.int/spaceinimages/Images/2019/02/Ultra-precise_navigation

GPS, ADS-B may be out in Southeast during 'interference tests' AOPA calls FAA's response to flight safety risk unacceptable:

<https://www.linkedin.com/pulse/faa-response-gps-drill-unacceptable-aopa-dana-a-goward/>

<https://www.aopa.org/news-and-media/all-news/2019/february/05/gps-adsb-may-be-unavailable-in-southeast-during-interference-tests>

Parallel Computing Champion:

<https://www.linkedin.com/pulse/kathryn-mckinley-parallel-computing-champion-carlyn-chatfield/>

Two Satellites orbiting earth for 6 and a half years measure details of Van Allen radiation belts:

<https://www.nasa.gov/feature/goddard/2019/nasa-s-van-allen-probes-begin-final-phase-of-exploration-in-earths-radiation-belts>

China and Russia view our GPS satellites as a vulnerability:

<https://www.linkedin.com/pulse/china-russia-see-our-satellites-vulnerability-examiner-goward/>

<https://www.washingtonexaminer.com/opinion/china-russia-see-our-satellites-as-a-vulnerability>

5G or Not 5G? That is the question:

<https://breakingdefense.com/2019/02/the-global-battle-over-5g-trump-and-huawei/>

https://www.washingtonpost.com/national/health-science/by-relying-on-gps-devices-are-we-literally-losing-our-way/2018/11/30/dd9eb6ae-e9bd-11e8-bbdb-72fdbf9d4fed_story.html?utm_term=.e100cc60bb42

April 2019 GPS and GNSS necessary updates (Clock roll-over every 20 years):

<https://www.komando.com/happening-now/545977/the-y2k-of-gps-is-arriving-on-april-6-heres-what-you-need-to-know>

Predictions of the future as correctly perceived by Brad Parkinson in the early 1970's:

<https://www.forbes.com/sites/parmyolson/2019/02/13/the-father-of-gps-really-doesnt-like-having-his-location-tracked/#1a3a1fd15afa>

Warning about GPS Spoofing:

<https://www.deccanchronicle.com/nation/current-affairs/180219/gps-spoofing-a-new-cyber-weapon.html>

A need for GPS backup:

<https://www.linkedin.com/pulse/gps-backup-missing-piece-national-infrastructure-hearings-goward/>

<https://rntfnd.org/wp-content/uploads/RNTF-Statement-for-the-Record-House-TI-Feb-2019.pdf>

<https://rntfnd.org/wp-content/uploads/RNTF-Statement-for-the-Record-Senate-Commerce-Feb-2019.pdf>

Russian Jam/Spoof-proof Kamikaze Drones?:

<https://www.linkedin.com/pulse/russian-jamspoof-proof-kamikaze-drones-dana-a-goward/>

<https://www.popularmechanics.com/military/aviation/a26414352/kalashnikov-kub-bla-drone/>

GPS Rollover 6 April 2019:

<https://www.xyht.com/gnsslocation-tech/wnro/> (Other links are contained within for specific GPS Receiver Manufacturers)

Government Researchers Addressing GPS Vulnerabilities:

<https://www.linkedin.com/pulse/government-researchers-working-address-gps-inside-gnss-goward/>

<https://insidegnss.com/government-researchers-working-to-address-gps-vulnerabilities/>

<https://www.fbo.gov/index?s=opportunity&mode=form&id=fa80c6d022e64b441313a97af28e8f09&tab=core&cview=0>

<https://www.fbo.gov/index?s=opportunity&mode=form&id=68dfd959363ffdeb96f61c065e212ef7&tab=core&cview=0>

Application Programming Interface (API) for NovAtel GNSS Receivers

(Please notice distinction of having both Overview and Supporting Products Tabs):

<https://www.novatel.com/products/firmware-options/firmware/api/>

<https://www.novatel.com/products/firmware-options/firmware/api/#relatedProducts>

Report: Russian Navy Gets New Precision Terrestrial System to Backup GPS/GLOMANS:

<https://www.linkedin.com/pulse/report-russian-navy-gets-new-precision-terrestrial-system-goward/>

<https://insidegnss.com/report-russian-navy-gets-new-precision-terrestrial-system-to-backup-gps-glonass/>

Government GPS Jamming and Spoofing a Risk to Commercial Shipping:

<https://www.linkedin.com/pulse/government-gps-jammer-spoofing-risk-commercial-shipping-goward/>

"Government sponsored GPS interference as a risk to commercial shipping," identifies high levels of activity in some of the world's busy shipping routes.

Impacted systems aboard commercial vessels include GPS, ECDIS, AIS, VSAT, Fleet Broadband, VHF, LRIT, and Inmarsat C.

The report suggests several procedural and hardware/software mitigations to counter these threats.

Copies of the report are available at the Risk Intelligence website at <https://riskintelligence.eu/download>.

GPS Jamming Scheduled across the U.S.-AOPA:

<https://www.linkedin.com/pulse/gps-jammer-scheduled-across-us-aopa-dana-a-goward/>

<https://rntfnd.org/2018/07/10/dod-exercises-increasingly-jammer-gps-interfering-w-air-traffic-rtca/>

<https://www.aopa.org/news-and-media/all-news/2019/february/27/more-gps-interference-exercises-planned>

<https://www.aopa.org/news-and-media/all-news/2018/march/14/keeping-nextgen-on-the-air>

https://www.rtca.org/sites/default/files/intentional_gps_interference_approved.pdf

DOT Lagging on GPS Backup Demo:

<https://www.linkedin.com/pulse/chairman-defazio-letter-questions-dot-secretary-lagging-goward/>

https://rntfnd.org/wp-content/uploads/Vople_vulnerability_assess_2001.pdf

<https://www.congress.gov/bill/115th-congress/senate-bill/140/text#toc-id89e563a8d5524c5a84cacf66865f7ba1>

Air Navigation Jitters - Aerospace America:

<https://www.linkedin.com/pulse/air-navigation-jitters-aerospace-america-dana-a-goward/>

<https://aerospaceamerica.aiaa.org/features/air-navigation-jitters/>

Dual-Frequency GNSS – An important location feature your phone is probably missing:

<https://www.xda-developers.com/dual-frequency-gnss-important-location-feature-your-phone-probably-missing/>

Now is the Time - Important NIST Workshop Registration Closing!:

<https://www.linkedin.com/pulse/now-time-important-nist-workshop-registration-closing-goward/>

<https://www.nist.gov/news-events/events/2019/03/access-assured-and-accurate-time-ii-assuredness-reference-architectures>

Galileo BOMBSHELL: EU prepared to RISK "safety of citizens" just to have Brexit "leverage":

<https://www.express.co.uk/news/uk/1096816/Brexit-news-Galileo-update-EU-UK-Europol-Theresa-May-deal-Philippe-Lamberts?>

Was GPS spoofing responsible for a "weird incident" at the Geneva Motor Show?:

<https://www.linkedin.com/pulse/gps-spoofing-responsible-weird-incident-geneva-motor-show-guy-buesnel/>

Luckily that was a conference for GNSS-industry professionals, and one of them, Logan Scott, took the initiative of borrowing a directional jamming detector from an exhibitor's stand and used it to track down the offending device:

<https://insidegnss.com/spoofing-incident-report-an-illustration-of-cascading-security-failure/>

Accidental GPS spoofing takes down smartphones at ION GNSS+ 2017 conference:

<https://www.linkedin.com/pulse/accidental-gps-spoofing-takes-down-smartphones-ion-gnss-guy-buesnel/>

Several reports are starting to circulate, talking about the incident – Logan Scott describes it in more detail here:

<http://www.insidegnss.com/node/5661>

Norway Reacts to Russian Jamming By Listening Harder - NRK:

<https://www.linkedin.com/pulse/norway-reacts-russian-jamming-listening-harder-nrk-dana-a-goward/>

<https://www.defensenews.com/global/europe/2019/03/08/norway-alleges-signals-jamming-of-its-military-systems-by-russia/>

NRK Finnmark:

Mounting station to detect GPS jamming:

<https://www.nrk.no/finnmark/monterer-malestasjon-for-a-oppdage-gps-jamming-1.14467017>

Norwegian aircraft suddenly lose the GPS signals: This is "jamming":

<https://www.nrk.no/finnmark/norske-fly-mister-plutselig-gps-signalene -dette-er- jamming -1.14282767>

GNSS chip manufacturers gear up for Galileo roll-out in U.S.:

<https://www.gsa.europa.eu/newsroom/news/gnss-chip-manufacturers-gear-galileo-roll-out-us>

<https://www.gsa.europa.eu/>

=====An Essay by Thomas H. Kerr III posted on LinkedIn on 17 March 2019=====

Two+ Page Essay about Possible Cause of Boeing 737 MAX 8 Failure

Thomas H. Kerr III, Ph.D., TeK Associates

Of course, it is much too early to be certain of the cause of the Boeing 737 Max 8 failure; but it is not too early to, perhaps, make an educated guess based on some related experience and some knowledge of technology trends. My speculation about the cause of the failure is related to possible presence of GPS spoofing (or denial of the GPS signal sought because of jamming) and how it may adversely affect INS behavior when an autopilot is activated or invoked.

While baro-altimeters or radar-altimeters had historically been used to “stabilize the vertical channel” of an airborne conventional Inertial Navigation System (INS) from the 1960’s through to the mid 1980’s:

[1] William S. Widnall, Prawn K. Sinha, "Optimizing the Gains of the Baro-Inertial Vertical Channel," *AIAA Journal of Guidance, Control, and Dynamics*, Vol. 3, pp. 172-178, 1980.

<https://arc.aiaa.org/doi/10.2514/3.55966>

[2] William S. Widnall, Arthur E. Bryson, "Comment on 'Optimizing the Gains of the Baro-Inertial Vertical Channel'," *AIAA Journal of Guidance, Control, and Dynamics*, Vol. 3, pp. 286-288, 1980. <https://arc.aiaa.org/doi/pdf/10.2514/3.55989>.

[3] E. M. Copps, G. J. Geier, W. C. Fidler, P. A. Grundy, "Optimal Processing of GPS Signals," *Navigation: Journal of the Institute of Navigation*, Vol. 27, No. 3, pp. 171-182, Fall 1980.

More recently, GPS has been offered as an alternative sensor candidate to be used to stabilize the vertical channel of an airborne INS (*sometimes in conjunction with an altimeter*):

[4] Jaewon Seo, Jang Gyu Lee, Chan Gook Park, "A New Error Compensation Scheme for INS Vertical Channel," *IFAC Proceedings*, Vol. 37, No. 6, pp. 1119-1124, 2004.

<https://pdfs.semanticscholar.org/7366/6bbb75dbb3e71e5314fe1e2f52a1e2b686af.pdf>.

Despite others recently experiencing GPS jamming and/or spoofing world-wide (example: Year-long ocean cruise finds GNSS interference...everywhere - GPS World:

<https://www.linkedin.com/pulse/year-long-ocean-cruise-finds-gnss-gps-world-dana-agoward/>, <https://www.gpsworld.com/year-long-ocean-cruise-finds-gnss-interference-everywhere/> , <https://insidegnss.com/spoofing-incident-report-an-illustration-of-cascading-security-failure/>, <https://www.defensenews.com/global/europe/2019/03/08/norway-alleges-signals-jamming-of-its-military-systems-by-russia/>,

<https://static1.squarespace.com/static/566ef8b4d8af107232d5358a/t/5c99488beb39314c45e782da/1553549492554/Above+Us+Only+Stars.pdf> , <https://www.c4reports.org/aboveusonlystars> , many have previously warned us about this important vulnerability that we should all be concerned about:

[5] Daher, J. K., Harris, J. M., Wheeler, M. L., "An Evaluation of the Radio Frequency Susceptibility of Commercial GPS Receivers," *IEEE AES Systems Magazine*, Vol. 9, No. 10, pp. 21-25, October 1994.

[6] Pinker, A., Smith, D., Walker, D., "Jamming the GPS Signal," *Proceedings of the 55th Annual Meeting of the ION*, Cambridge, MA, 28-30 June 1999.

[7] Littlepage, R. S., "The Impact of Interference on Civil GPS," *Proceedings of the 55th Annual Meeting of the ION*, Cambridge, MA, 28-30 June 1999. (He warned us early on! His presentation was more explicit than his paper. He was truly concerned.)

[8] Kerr, T. H., "Further Critical Perspectives on Certain Aspects of GPS Development and Use," *Proceedings of 57th Annual Meeting of the Institute of Navigation (ION)*, pp. 592-608, Albuquerque, NM, 9-13 Jun. 2001.

<http://www.tekassociates.biz/FurtherCriticalperspectivesonGPS2001.pdf>.

However, others are confident that these threats can be defeated by utilizing sufficient additional resources, such as Differential GPS (DGPS):

[9] White, N. A., Maybeck, P. S., DeVilbiss, S. L., "Detection of Interference/Jamming and Spoofing in a DGPS-Aided Inertial System," *IEEE Trans. on Aerospace and Electronic Systems*, Vol. 34, No. 4 pp. 1208-1217, Oct. 1998.

While some had pushed/lobbied for use of exclusively tightly-coupled INS/GPS systems early on for obtaining optimal accuracy (in presumed benign environments):

[10] <https://www.gpsworld.com/expert-advice-loose-coupling-and-whats-wrong-with-it/>, the historical warning trend (since the mid 1980's by Dr. Triveni N. Upadhyay's [and by Dr. Duncan Cox's] Mayflower Communications and, concurrently, by others at [now defunct] Intermetrics, Inc., e.g., Dale Kline) had sought use of loosely-coupled systems to be more robust and resistant and resilient in the face of subsystem failures or presence of jamming/spoofing. Hopefully, these newer approaches will be even more robust to jamming and spoofing in the future:

[11] Kim, K. H., Lee, J. G., Park, C. G., "Adaptive Two Stage Extended Kalman Filter for a Fault-Tolerant INS-GPS Loosely Coupled System," *IEEE Trans. on Aerospace and Electronic Systems*, Vol. 45, No. 1, pp. 125-137, Jan. 2009.

[12] <https://insidegnss.com/petite-new-spoofing-detector-aims-to-protect-gps-gnss-receivers-in-drones-vehicles-even-cell-phones/>

Regarding the Boeing 737 MAX 8 failure, the pilots reported experiencing a dramatic pitch down (or up) when the autopilot was activated. Such behavior would be expected if an improper anomalous value of GPS vertical (due to GPS spoofing) were being used in a vain attempt to stabilize the vertical INS channel. Other mechanisms may be at work as well, such as, lack of sufficient critical damping of oscillations in the autopilot. We will have to wait until analysis of the data from the Boeing 737 MAX 8 black boxes is complete. In the meantime, we recommend that at least 3 sensors be used instead of the current 2 external sensors. In this way, if there is disagreement between two sensors, a third could be used to perform voting if the original two are at odds and disagree. With 3 sensors, one can also use mid-point-select.

Anti-stall system active before Ethiopian 737 MAX crash: sources:

<https://news.yahoo.com/anti-stall-system-active-ethiopian-737-max-crash-174925596--finance.html>

Geneva Auto Show Spoofed to England and 2036 - JALOPNIK:

<https://www.linkedin.com/pulse/geneva-auto-show-spoofed-england-2036-jalopnik-dana-a-goward/>

There is something very weird going on With Cars' GPS systems at the Geneva Motor Show - JALOPNIK:

https://jalopnik.com/theres-something-very-weird-going-on-with-cars-gps-syst-1833138071?utm_content=87171296&utm_medium=social&utm_source=linkedin&hss_channel=lcp-10305509

Frequency Electronics to Qualify Atomic Clocks for Lockheed Martin:

<https://www.satellitetoday.com/imagery-and-sensing/2019/03/15/frequency-electronics-to-qualify-atomic-clocks-for-lockheed-martin/>

Fighting Organized Crime by Finding GPS Jammers - Chronos:

<https://www.linkedin.com/pulse/fighting-organized-crime-finding-gps-jammers-chronos-dana-a-goward/>

Pilots Putting More and More Emphasis on How 737 Max Crews Were Trained:

<https://www.theatlantic.com/notes/2019/03/training-regulation-and-737-max/585142/>

<https://www.nytimes.com/2019/03/24/business/boeing-737-pilots-simulators.html>

GPS jamming on agenda as Russian defense delegation sat down for talks in Oslo:

<https://thebarensobserver.com/en/security/2019/03/gps-jamming-agenda-russian-defence-delegation-sits-down-talks-oslo>

GPS Rollover in April 2019:

<https://www.bostonglobe.com/business/2019/03/21/tick-tick-gps-clock-winding-down/2Lujyslbp9zXkfgzIYfdKK/story.html>

GPS III Space Vehicle 02 "Magellan" arrives in Florida; Prepares for July launch:

<https://www.afspc.af.mil/News/Article-Display/Article/1792063/gps-iii-space-vehicle-02-magellan-arrives-in-florida-prepares-for-july-launch/>

Results now arriving: <https://www.seattletimes.com/business/boeing-aerospace/failed-certification-faa-missed-safety-issues-in-the-737-max-system-implicated-in-the-lion-air-crash/>

Doomed jets lacked two safety features Boeing sold only as extras - NYT: <https://seekingalpha.com/news/3444817-doomed-jets-lacked-two-safety-features-boeing-sold-extras-nyt>

<https://www.nytimes.com/2019/03/24/business/boeing-737-pilots-simulators.html>

<https://www.ibtimes.com/will-boeings-problems-spell-trouble-ge-aviation-2778031>

Exposing GPS Spoofing in Russia and Syria - 9,000+ Incidents in New C4ADS Report:

<https://static1.squarespace.com/static/566ef8b4d8af107232d5358a/t/5c99488beb39314c45e782da/1553549492554/Above+Us+Only+Stars.pdf>

<https://www.c4reports.org/aboveusonlystars>

US Navy Opens Lab for Navigation w/o GPS:

<https://www.linkedin.com/pulse/us-navy-opens-lab-navigation-wo-gps-dana-a-goward/>

https://www.navy.mil/submit/display.asp?story_id=108944

Coast Guard Navigation Center: Special Notice to All Mariners Who Use GPS Equipment

<https://amerisurv.com/2019/03/20/coast-guard-navigation-center-special-notice-to-all-mariners-who-use-gps-equipment/>

DOT Lagging on GPS Backup Demo:

<https://www.linkedin.com/pulse/chairman-defazio-letter-questions-dot-secretary-lagging-goward/>

https://rntfnd.org/wp-content/uploads/Vople_vulnerability_assess_2001.pdf

<https://www.congress.gov/bill/115th-congress/senate-bill/140/text#toc-id89e563a8d5524c5a84cacf66865f7ba1>

Homeland Missile Defense System Successfully Intercepts ICBM Target:

<https://mda.mil/news/19news0003.html?fbclid=IwAR2Cd0jAFPDBcfBZ9AnQ39dnb5ofOciasbtbqCHsaFDrLCPyUiFBT5R7wE>

Results now arriving: <https://www.seattletimes.com/business/boeing-aerospace/failed-certification-faa-missed-safety-issues-in-the-737-max-system-implicated-in-the-lion-air-crash/>

Doomed jets lacked two safety features Boeing sold only as extras - NYT: <https://seekingalpha.com/news/3444817-doomed-jets-lacked-two-safety-features-boeing-sold-extras-nyt>

<https://www.nytimes.com/2019/03/24/business/boeing-737-pilots-simulators.html>

<https://www.ibtimes.com/will-boeings-problems-spell-trouble-ge-aviation-2778031>

GPS Rollover in April 2019:

<https://www.bostonglobe.com/business/2019/03/21/tick-tick-gps-clock-winding-down/2LujysIbp9zXkfgzIYfdKK/story.html>

GPS III Space Vehicle 02 "Magellan" arrives in Florida; Prepares for July launch:

<https://www.afspc.af.mil/News/Article-Display/Article/1792063/gps-iii-space-vehicle-02-magellan-arrives-in-florida-prepares-for-july-launch/>

Doomed jets lacked two safety features Boeing sold only as extras - NYT:

<https://seekingalpha.com/news/3444817-doomed-jets-lacked-two-safety-features-boeing-sold-extras-nyt>

'GPS is a Maritime Cyber Shortfall' - Brookings Panel:

<https://www.linkedin.com/pulse/gps-maritime-cyber-shortfall-brookings-panel-dana-a-goward/>

<https://www.freightwaves.com/news/maritime/congress-seen-as-failing-to-prioritize-cyber-risks>

https://www.brookings.edu/wp-content/uploads/2019/03/fp_20190325_maritime_commerce_transcript.pdf

<https://www.brookings.edu/events/securing-maritime-commerce-the-u-s-strategic-outlook-2/>

Benefits coming from GPS III constellation:

<https://www.gpsworld.com/benefits-coming-from-gps-iii-constellation/>

FAA expects Boeing to come up with new software to fix the grounded 737 Max in a matter of weeks:

<https://www.businessinsider.com/boeing-expected-to-submit-737-max-software-fix-in-weeks-2019-4>

The Boeing 737 Max is likely to be the last version of the best-selling airliner of all time:

<https://www.businessinsider.com/boeing-737-max-design-pushed-to-limit-2019-3>

GPS has its own 19-year cicada problem:

<https://www.rollcall.com/news/policy/gps-satellites-cybersecurity>

Russia accused of massive GPS spoofing campaign:

<https://nakedsecurity.sophos.com/2019/04/01/russia-accused-of-massive-gps-spoofing-campaign/>

The Robert Strauss Space Security and Safety Program at The University of Texas at Austin now has an official website:

<https://lnkd.in/etahW4T>

Boeing delays 737 MAX software fix delivery:

<https://arstechnica.com/information-technology/2019/04/boeing-delays-737-max-software-fix-delivery/>

Homeland Missile Defense System Successfully Intercepts ICBM Target:

<https://mda.mil/news/19news0003.html?fbclid=IwAR2Cd0jAFPDBcfBZ9A-nQ39dnb5ofOciastbqCHsaFDLCPyUifBT5R7wE>

GPS Rollover Event May Cause Devices, Systems To Go Haywire:

<https://sanfrancisco.cbslocal.com/2019/04/02/gps-week-rollover-event-devices-systems/>

A Preview of Things to Come regarding GPS and its Planned Updates:

"GPS affects everything we do," Parkinson told KPIX 5 in a recent interview at the Marines' Memorial Club in San Francisco.

GPS is a network of 31 satellites owned by the U.S. government and operated by the Air Force. GPS provides many services for civilian uses, by providing location, and syncing up critical systems back on earth.

"It affects timing, banking, cell towers, airplanes, ships, passengers in cars," explained Parkinson. "It is affecting everything that we can imagine."

The power grid, financial markets, delivery trucks, and emergency services all benefit from GPS. In California, public safety agencies, such as the California Highway Patrol and Cal Fire utilize GPS timing at the major dispatch console systems, which is transmitted to field personnel via radio.

USGS officials monitor seismic movement or tectonic plate motion using GPS

"We're completely reliant upon GPS," remarked GPS expert Dana Goward, who served as the maritime navigation authority for the United States.

He is currently serving as President of the Resilient Navigation and Timing Foundation or RNTF. The nonprofit is dedicated to protecting, toughening, and augmenting GPS signals.

Goward explained that GPS works by sending out timing signals. On each satellite, there are multiple atomic clocks. GPS relies on precision timing to operate.

"Essentially, all the GPS satellites are just very, very precise clocks," said Goward.

In that timing signal, there is a timestamp containing a code. The code is based on the week and seconds in that week when "GPS Time" began or was set. That date started on January 6, 1980.

But since "GPS time" uses only 10-bits to count the weeks and seconds within that week, it can only cover a finite period of time before it runs out of space.

"It turns out it happens roughly every 20 years," said Parkinson.

That finite period of time is 1,024 weeks or precisely 19.7 years. This period of GPS time called an epoch. When GPS time reaches its finite period, it "rolls over" or resets to zero.

This rollover happened once before on or around August 21, 1999, but there were few documented problems, according to experts. This time, it's different.

"20 years ago, you did not have a GPS in your cell phone," said Parkinson.

Parkinson estimated that worldwide, there are 4 billion uses of GPS in cell phones alone. The annual benefit to the U.S. economy in terms of productivity is \$60 billion.

A GPS rollover event could throw off time by rolling back to the wrong date, disrupt critical systems by throwing them out of sync with time, not to mention make your personal GPS device perform in a bizarre manner.

"If you're driving your car and it were to suddenly say you're in the middle of the Pacific Ocean, be very suspicious," cautioned Parkinson.

The U.S. Department of Homeland Security has published a bulletin warning about the upcoming event and recommending GPS users make sure their devices are properly updated.

Most modern devices should do just fine. An official at California's Office of Emergency Services told KPIX 5 that the agency has performed an assessment of various public safety agency radio systems and has worked with the manufacturers of the GPS timing receivers. The official said the manufacturers of devices used by Cal OES have assured them the devices will not be impacted by the rollover event.

A U.S. Geological Survey seismic expert told KPIX 5 that some of its older seismic monitoring equipment have already rolled back to a wrong date. The first report of the issue was actually in July 2018. A USGS team discovered the problem when data from these sensors started coming in timestamped not from 2018, but from 1998.

The equipment was beyond its obsolescence point, and the team learned the devices could no longer be supported by the manufacturer with any kind of firmware update.

The team wrote its own software fix, and that went out to all the other regional software networks. The data, according to the USGS official, had to be shifted 1,024 weeks or 619,315,200 seconds, putting the network back in sync.

It's also important to note just because April 6th comes and goes without any apparent issues with your GPS, that there won't be a rollover. Experts caution how actual errors may kick in before or later.

The good news is that GPS manufacturers are well aware of the upcoming issue, Parkinson said. He added if you're operating a company and remain unsure about whether the rollover will impact you, you can get a GPS/GNSS simulator that can walk your network through the event and you can see if there is a glitch or not. This could save you a major headache. (link two examples of companies that make GPS simulators)

In the future, the modernized GPS navigation messages will use 13-bits instead of 10-bits. Experts explain that will push rollovers to roughly every 157 years instead of the current 20.

The best advice: trust but verify that your GPS device is updated, don't panic and have a backup plan. It's never too late to learn how to read a paper map.

And, while it may sound melodramatic, in times of any major disaster, if GPS goes down for a prolonged period of time, it's a good skill for everyone to know how to navigate using the sun, moon, and stars.

New GPS Tracking System Being Tested to Avoid Plane Disappearances:

<https://www.travelpulse.com/news/airlines/new-gps-tracking-system-being-tested-to-avoid-plane-disappearances.html>

How to Synthesize the Radiation Pattern of an Antenna Array:

https://www.comsol.com/blogs/how-to-synthesize-the-radiation-pattern-of-an-antenna-array/?utm_content=buffer06330&utm_medium=Social&utm_source=LinkedIn&utm_campaign=comsol_social_pages

"Roy Azevedo, president of Raytheon's Space and Airborne Systems unit, has firm ideas about where the military technology business is headed--and how his company can stay ahead of the pack." Read more from Forbes: https://rtn.co/Forbes_41

Russia Is Tricking GPS to Protect Putin:

<https://foreignpolicy.com/2019/04/03/russia-is-tricking-gps-to-protect-putin/>

GMV Uses Skydel SDX Flexibility to Simulate GNSS Timing Events:

<https://insidegnss.com/gmv-uses-skydel-sdx-flexibility-to-simulate-gnss-timing-events/>

E-GNSS key to increasing capacity, efficiency and sustainability in European rail networks:

<https://www.gsa.europa.eu/newsroom/news/e-gnss-key-increasing-capacity-efficiency-and-sustainability-european-rail-networks>

Record-Breaking Satellite Advances NASA's Exploration of High-Altitude GPS:

<https://www.linkedin.com/pulse/record-breaking-satellite-advances-nasas-exploration-lieberman-/>

"GPS Critical, Need Backups" - White House Official:

<https://www.linkedin.com/pulse/gps-critical-need-backups-white-house-official-dana-a-goward/>

Preparing for Non-GPS Scenario:

<https://i-hls.com/archives/90236>

E-GNSS key to increasing capacity, efficiency and sustainability in European rail networks:

<https://www.gsa.europa.eu/newsroom/news/e-gnss-key-increasing-capacity-efficiency-and-sustainability-european-rail-networks>

GPS glitch could hit power grid and trading systems:

<https://www.theengineer.co.uk/gps-reset-timing-signal/>

Your GPS navigator might go nuts tomorrow - update your device now!:

<https://www.afterdawn.com/news/article.cfm/2019/04/05/gps-week-number-bug-2019>

Tracker for ArcGIS v19.1.0 Released!:

<https://www.esri.com/arcgis-blog/products/tracker/announcements/tracker-for-arcgis-v19-1-0-released/>

Comprehensive Intro — GPS/GNSS Operations (4-day course):

https://www.navtechgps.com/events/course_346_details/

Lockheed and Israeli company teaming up for US Army missile defense radar sense-off:

<https://www.defensenews.com/land/2019/04/05/lockheed-and-israeli-company-teaming-up-for-us-army-missile-defense-radar-sense-off/>

ESCAPE project launches positioning module for autonomous driving:

<https://www.geospatialworld.net/news/escape-project-launches-positioning-module-for-autonomous-driving/>

Space Weather News for April 5, 2019

<http://spaceweather.com>

<https://www.spaceweatheralerts.com>

SPACE WEATHER PROBES SHATTER GPS RECORD: We all use GPS--to find ourselves in the back country, to navigate to the grocery store, to locate lost pets. NASA's four MMS spacecraft recently used the same system to locate themselves an astonishing 116,300 miles from Earth, almost halfway to the Moon. This shatters previous records and expectations of how far away GPS can work. Visit today's edition of Spaceweather.com to find out how they did it.

When Putin's around, GPS goes haywire, study finds:

<https://www.cbsnews.com/news/when-putins-around-gps-goes-haywire-study-finds/>

NASA Spacecrafts break record for navigating away from Earth with GPS:

<http://www.clarksvilleonline.com/2019/04/07/nasa-spacecrafts-break-record-for-navigating-away-from-earth-with-gps/>

The Global Positioning System Resets:

<https://www.wmky.org/post/global-positioning-system-resets>

Older GPS receivers could believe it is 1999 again :: WRAL.com:

<https://www.wral.com/older-gps-receivers-could-believe-it-is-1999-again/18307726/>

Fast Facts: What is GPS?:

<https://maritime-executive.com/article/fast-facts-what-is-gps>

Save the Dates 5 - 7 June, Alexandria, Virginia!:

<https://www.linkedin.com/pulse/save-dates-5-7-june-alexandria-virginia-dana-a-goward/>

Visible Infrared Imaging Radiometer Suite (VIIRS) CHANGING THE WAY WE SEE EARTH:

From 500 miles up in space, the Visible Infrared Imaging Radiometer Suite is changing the way we see Earth, and its value goes well beyond weather prediction. Its data is critical to industries as diverse as agriculture, finance, transportation, insurance and energy:

<https://www.raytheon.com/capabilities/products/viirs>

Record-breaking satellite advances NASA's exploration of high-altitude GPS- GPS signals extend farther than expected, meaning future space missions can reliably use GPS at extreme altitudes.:

<https://www.gpsworld.com/record-breaking-satellite-advances-nasas-exploration-of-high-altitude-gps/>

Multiple Boeing 787's Get Grounded In China Due To GPS Issue - Simple Flying:

<https://www.linkedin.com/pulse/multiple-boeing-787s-get-grounded-china-due-gps-issue-dana-a-goward/>

<https://simpleflying.com/boeing-787-china-grounding/>

Two-shot salvo - Defensive technologies destroy a ballistic missile target in test:

<https://www.raytheon.com/news/feature/two-shot-salvo>

Digital Trove of Apollo Artifacts Debuts on Draper's New Website: Hack the Moon | Draper:

<https://www.draper.com/news-releases/digital-trove-apollo-artifacts-debuts-drapers-new-website-hack-moon>

New military code about to board 700+ platforms:

<https://www.gpsworld.com/new-military-code-about-to-board-700-platforms/>

Precise GNSS Positioning Using Android Devices:

<https://www.linkedin.com/pulse/precise-gnss-positioning-using-android-devices-matt-ghahremani/>

<https://developer.android.com/guide/topics/sensors/gnss>

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5677087/>

Somebody forgot to upgrade: Flights delayed, cancelled by GPS rollover:

<https://arstechnica.com/information-technology/2019/04/gps-rollover-apparently-cause-of-multiple-flight-delays-groundings/>

These simple navigating tools could save you when GPS can't:

<https://www.popsci.com/navigating-tools-without-gps>

More Reports of Aircraft Delays Due GPS Rollover - Ars Technica:

<https://www.linkedin.com/pulse/more-reports-aircraft-delays-due-gps-rollover-ars-technica-goward/>

<https://arstechnica.com/information-technology/2019/04/gps-rollover-apparently-cause-of-multiple-flight-delays-groundings/?comments=1&post=37162991>

Boeing has called 737 Max 8 "not suitable" for certain high-elevation airports like DIA

<https://www.denverpost.com/2019/04/11/boeing-737-max-8-denver-airport/>

Boeing makes 96 flights to test software on troubled Max jet:

<https://www.miamiherald.com/news/business/article229138809.html>

GPS Rollover Hamstrings New York City Wireless Network and a Handful of Other Systems - Inside GNSS:

<https://www.linkedin.com/pulse/gps-rollover-hamstrings-new-york-city-wireless-network-dana-a-goward/>

<https://insidegnss.com/gps-rollover-hamstrings-new-york-city-wireless-network-and-a-handful-of-other-systems/>

Pentagon's Jason group is not worth mourning:

Opinion piece deliberately misquotes me and draws false and inappropriate conclusions.

<https://lnkd.in/ewqbEke>

I actually stated "sadly the DoD has a lovely record of ignoring" the NAS/NRC and DSB panels while they are directed in a manner leading to political use of their work. JASON academic focus and independence is substantially more to be trusted.

New Study Demonstrates Radio Signal Benefits From Decades-Old Theory:

<https://www.linkedin.com/pulse/new-study-demonstrates-radio-signal-benefits-from-alvin-lieberman-/>

Boeing to Upgrade U.S. Missile Defense System:

<https://www.engineering.com/AdvancedManufacturing/ArticleID/18826/Boeing-to-Upgrade-U-S-Missile-Defense-System.aspx>

US Missile Defense Proves “Two-Shot Salvo” Successful in Intercepting ICBM:

<https://www.engineering.com/DesignerEdge/DesignerEdgeArticles/ArticleID/18841/US-Missile-Defense-Proves-Two-Shot-Salvo-Successful-in-Intercepting-ICBM.aspx>

Moriba Jah, Director of Computational Astronautical Sciences and Technologies at Institute for Computational Engineering and Sciences (ICES)

Specialties: Kalman filtering, orbit determination, attitude determination, data fusion, astrodynamics, state estimation, algorithm development, data science, data analytics, space object behavioral science, space situational awareness, space surveillance, inverse problems.

Researchers from the Johns Hopkins Applied Physics Lab and The Johns Hopkins University School of Medicine are studying how pattern-based thinking can be used to study robots in motion! Much like how an animal’s brain reroutes its path while moving, researchers are applying similar algorithms to groups of robots to automatically adapt to changes in the environment.

APL's Grace Hwang discusses #swarmalators & more at SPIE, the international society for optics and photonics Wed April 17th, 2019 <https://lnkd.in/ec8ySD7>

#Swarmalator | #JHUAPL | #SwarmControl | #Robots | #SwarmRobots | #Robotics

Northrop Grumman Awarded \$713 Million for Poland Next-Generation Air and Missile Defense:

IBCS to provide leap-ahead capabilities for Poland's national air and missile defense program while increasing NATO security efforts

C4ISR • IAMD • Global • IBCS (Integrated Air and Missile Defense Battle Command System) • Europe

<https://news.northropgrumman.com/news/releases/northrop-grumman-awarded-713-million-for-poland-next-generation-air-and-missile-defense>

These 5 Personal Security Devices Thwart Identity Theft - Northrop Grumman:

The cost of identity theft is at an all-time high, with people reportedly losing \$905 million overall in 2017. Investing in these five personal security devices could reduce one's risk of falling victim to identity theft. #NorthropGrumman

<https://now.northropgrumman.com/these-5-personal-security-devices-thwart-identity-theft/>

The way ahead for SSA and beyond:

Feel privileged to have been in the room to help initiate the discussion and see it play out between the CSAF and Dr. Roper. Thanks to Maj Gen Crider and Mr. Robert Sivilli for really making it happen!

<https://breakingdefense.com/2019/04/roper-air-force-cloud-to-track-target-all-from-moon-to-ground-exclusive/?>

From Moriba Jah's comment on the above:

See <http://astria.tacc.utexas.edu/AstriaGraph>

for a crowd-sourced and cloud-based capability that's been running autonomously for over a year...Orbit Determination
astria.tacc.utexas.edu

The "Astria OD/LeoLabs Data" source shows the results we get by doing orbit determination on radar...

Russian GPS Spoofing - Comedy on The Daily Show with Trevor Noah:

<https://www.linkedin.com/pulse/russian-gps-spoofing-comedy-daily-show-trevor-noah-dana-a-goward/>

https://www.youtube.com/watch?v=sCKFYsRcc_M&feature=youtu.be&t=98

The Future of Laser Missile Defense:

Laser weapons move literally at the speed of light, and can already defeat drones.

But what would it take to fry a ballistic missile? <https://rtn.co/2I6SDFJ>

Hyten: Hypersonic missile defense satellites a job for the Space Development Agency:

<https://spacenews.com/hyten-hypersonic-missile-defense-satellites-a-job-for-the-space-development-agency/>

"Gen. John Hyten, commander of U.S. STRATCOM & nominated to be the next vice chairman of the Joint Chiefs of Staff, oversees operations involving some of the #military's most sensitive #satellites that detect & track enemy #missiles.

Hyten has been insistent that #DoD needs a layer of satellites in lower orbits to track targets much closer to Earth than the existing #missile warning constellation that operates from geostationary orbit. "That has to be a piece of the architecture,"..."You can't defend against something that you can't see," he said. #DoD needs to build stronger defenses against emerging #hypersonic #missiles that are launched into #space but then glide into the atmosphere & maneuver in unpredictable trajectories, said Hyten...

#MissileDefense Agency has been studying options to deploy a sensor layer in space but there is no official DoD requirement to develop or build one. "Nobody is really looking at hypersonic sensing," said Hyten. It's been talked about but "nobody's really looking at how do we do this."

Hyten agrees with #SDA Director Fred Kennedy that DoD should rapidly develop a space sensor constellation in LEO using commercially available #technology & test it out before official requirements are written for a system." #NatSec #Innovation #Acquisition

Very interesting: Europe needs an independent nuclear explosions monitoring system:

<https://eos.org/editors-vox/measuring-explosive-events-on-earth-from-the-ionosphere>

The Russians are screwing with the GPS system to send bogus navigation data to thousands of ships:

<https://www.businessinsider.com/gnss-hacking-spoofing-jamming-russians-screwing-with-gps-2019-4>

GPS takes into account mysterious black hole time warps - GPS World:

Last week scientists produced the first image of a #blackhole, shining a light on one of the universe's great mysteries. #DYK know the technique used to get the black hole image relied on #GPS systems? Read how in this GPS World magazine article <https://hxgn.biz/2Gqyw31> #GNSS

<https://www.gpsworld.com/gps-takes-into-account-mysterious-black-hole-time-warps/>

Determine Longitude:

<https://www.youtube.com/watch?v=b7yoXhbOQ3Y>

Navy Investing in Researching Next-Generation Missiles, Enhancing Current Ones:

<https://news.usni.org/2019/04/15/navy-investing-in-researching-next-generation-missiles-enhancing-current-ones>

Satellite Navigation: A Global Perspective:

<https://www.satellitetoday.com/imagery-and-sensing/2019/04/16/satellite-navigation-a-global-perspective/>

Lockheed Martin Space wins \$879 million Minuteman III missile contract - Denver Business Journal:

<https://www.bizjournals.com/denver/news/2019/04/17/lockheed-martin-space-nuclear-missile-contract.html>

BAE Systems Invents A Radically Different Way Of Speeding Defense Innovation:

<https://www.forbes.com/sites/lorenthompson/2019/04/15/bae-systems-inc-invents-a-radically-different-way-of-speeding-defense-innovation/#60b44f881f9d>

"The world's most advanced short-range ground-based air defence system

will soon enter service with the Australian Defence Force..." <https://rtn.co/2Xnoy8h>

Harris receives GPS III follow-on payload contract:

<https://www.geospatialworld.net/news/harris-receives-gps-iii-follow-on-payload-contract/>

Learn more about Hypersonics on our website: <https://lnkd.in/gsaXt4i>

#AFResearchLab #TechTuesday

Septentrio GPS/GNSS helps cars avoid collisions on a smart highway

Belgium has launched its first smart highway test environment. Septentrio GPS/GNSS receivers are integrated into vehicles and infrastructure to provide dependable, high-accuracy positioning and to aid sensor fusion in driverless navigation and truck platooning.

<https://www.gpsworld.com/septentrio-gps-gnss-helps-cars-avoid-collisions-on-a-smart-highway/>

From Munich: Satellites and the City:

<https://insidegnss.com/from-munich-satellites-and-the-city/>

GPS Problems for Thousands in Warsaw/Iran Receivers Think it's 2099:

<https://www.linkedin.com/pulse/gps-problems-thousand-warsaw-iran-receivers-think-its-dana-a-goward/>

Determining Sample Size in One Picture:

<https://www.datasciencecentral.com/profiles/blogs/determining-sample-size-in-one-picture>

Living and Working in Space: Radiation:

While we get ready to send our NASA Astronauts farther than ever before, understanding the conditions of deep space is critical to keeping them safe & happy. A change they'll encounter is a 50-60% increase in radiation. Here's how we're preparing for it: <https://lnkd.in/ewbfJZ>

ESA Thinking Beyond GNSS to PNT - Wants Proposals:

<https://www.linkedin.com/pulse/esa-thinking-beyond-gnss-pnt-wants-proposals-dana-a-goward/>

<https://navisp.esa.int/opportunity/details/8/show>

Intelsat 29e Fails - Via Satellite :-

<https://www.satellitetoday.com/launch/2019/04/19/intelsat-29e-fails/>

Space Threat Assessment 2019:

While the vulnerabilities of U.S. national security space systems are often discussed publicly, the progress other nations are making in counterspace systems is not as readily accessible. Space Threat Assessment 2019 reviews the open-source information available on the counterspace capabilities that can threaten U.S. space systems.

<https://www.csis.org/analysis/space-threat-assessment-2019?lrc=ccb68dc2-4016-483a-95ac-18e2c2862094>

Paving the Way for Precise Small Lunar Landers:

Up, up and away! Last week we hitched a ride on a World View balloon to test a navigation system for NASA - National Aeronautics and Space Administration.

<https://www.draper.com/news-releases/paving-way-precise-small-lunar-landers>

NovAtel:

Our editing team is putting the finishing touches on the video of Dr. Parkinson's presentation from his visit to our office earlier this month. Be one of the first to see the final product by subscribing to NovAtel email updates and we'll send you a copy to watch in its entirety when it's ready.

A Northrop Grumman Antares-Cygnus will launch today, 17 April 2019 at 4:46 PM EDT (20:46 UTC) from Wallops Island, Virginia ferrying supplies and science instruments to the International Space Station. Live coverage of the launch is available on NASA TV beginning at 4:15 PM EDT/20:15 UTC.

#space #spaceexploration #spaceflight #spacestation #rocket

Image credit: NASA | File photo of Antares-Cygnus.

On Effective Space Traffic Management. Thanks to AIAA and co-authors of this paper, including Moriba Jah, Sandra Magnus, Susan Helms, Pam Melroy, Mark Brown, and Madhurita Sengupta. Previously published in 2017. From the Executive Summary: "With alarming and recent increase, space has become more crowded with earth orbiting space craft and debris, bottlenecks

have emerged in highly desirable regions of operation, and Government cataloging, analyzing, and warning systems are becoming overwhelmed and inadequate to the conditions at hand. The clear implication of all of these factors is that safe and uninterrupted operations in earth orbit may be at risk. This is strong motivation for the development and deployment of a mature Space Traffic Management (STM) system. The suggested topics in this paper in no way comprise the necessary solution in its entirety and there is a strong need for much additional discussion. This paper serves as a framework, for deliberation and action by a broad community of practice that must become a community of participation in a coherent plan of attack. The framework is a vehicle to initiate a structured dialog, preserve continuity of thought, and provide a catalyst for change with the best interests of a multi-faceted space community in mind."

<https://www.linkedin.com/feed/>

Do you have Extreme Environments? GT has the Disruptive Nanoceramic Materials.:

EMT Madrid announces readiness to Galileo in all the metropolitan bus fleet:

Major public transportation operator's #UseGalileo and so does @ in Madrid! With more than 2,050 buses being Galileo enabled, EMT is paving the way for smart mobility. Integrating Galileo-enabled positioning on-board units in public transportation, allows the communication of the exact position of buses, thus enabling commuters to plan their journeys and for public transport timings to be more accurate!

#smartmobility #galileo #buses #publictransport #madrid

<https://www.gsa.europa.eu/newsroom/news/emt-madrid-announces-readiness-galileo-all-metropolitan-bus-fleet>

<https://www.gsa.europa.eu/>

Enhanced Positioning from Galileo Helping EMT Madrid Metropolitan Bus Fleet:

<https://insidegnss.com/enhanced-positioning-from-galileo-helping-emt-madrid-metropolitan-bus-fleet/>

The Chimera specification for an L1C security overlay has gone to unlimited distribution. Both NMA and watermark features are included. Of particular note; there are two watermark channels, a fast channel and a slow channel as described in my 2013 paper. Please attack this design; seriously, we want to know what defects it might have. #security #gps #gnss #spoofing

It's #NationalParkWeek! What do National Park Service parks look like from 250 miles above Earth? ☀ Take a peek at our gallery of images captured from the International Space Station to see these amazing places from across the country:

<https://lnkd.in/eeR7DWB>:

<https://www.nasa.gov/content/space-station-view-of-us-national-parks>

Total station Theft from Uxbridge College car park in broad daylight!

Below is an image of the car used in the theft.

Police have been informed, total station theft logged with Leica & kit was pin coded! I have little hope of getting it back though - we have had a long list of stolen kit in the last 12 months with absolutely nothing retrieved!

Most importantly our surveyors are safe - this was a snatch & grab theft in broad daylight in a bariered car park!

Sad times to be out on site surveying!

Stay safe - Stay vigilant.

intz likes this

Andy Kopito Program Director - Government Satellite Systems at Boeing 2d

I will be teaching a new course in Spacecraft Communication starting in August at Loyola Marymount University. This is a great introductory course for early career employees in the space industry. See the attached flyer for details. #:

eidou-3 navigation satellite launched on Long March 3B:

<https://www.nasaspacesflight.com/2019/04/beidou-3g2q-navigation-long-march-3b/>

The Navy is starting to put up real money for robot submarines:

<https://www.latimes.com/business/la-fi-boeing-undersea-drones-navy-contract-20190419-story.html>

All New U.K. Cars to Have Speed Limiters Installed By 2022:

<https://www.thedailybeast.com/all-new-uk-cars-to-have-speed-limiters-installed-by-2022>

Honeycomb Mirrors Make NASA's Webb the Most Powerful Space Telescope:

NASA's James Webb Space Telescope requires a primary mirror so large that it would not fit inside any existing rockets as one single, large mirror. Because of this, Webb is equipped with a revolutionary set of 18 hexagonal mirror segments that are able to fold to fit inside the rocket fairing. Their honeycomb like arrangement allows for Webb to have the largest possible reflective surface area to make observations, with the least amount of dead space in between each.

<https://www.linkedin.com/pulse/honeycomb-mirrors-make-nasas-webb-most-powerful-space-lieberman-/>

What do drones and GPS owe to a 1744 shipwreck?:

<https://www.bbc.com/news/business-47161370>

Phased-Array Ka-Band Antenna in an Aircraft Demonstrates Two-Way Wideband Data Links:

<https://www.everythingrf.com/News/details/7967-Phased-Array-Ka-Band-Antenna-in-an-Aircraft-Demonstrates-Two-Way-Wideband-Data-Links#.XLmRKRYpHWw.linkedin>

FCC to Approve Ligado? - Not so fast....:

<https://www.linkedin.com/pulse/fcc-approve-ligado-so-fast-dana-a-goward/>

Ligado Wins FCC Chairman's Backing on Needed Spectrum:

<https://www.wsj.com/articles/ligado-wins-fcc-chairmans-backing-on-needed-spectrum-11555588800?redirect=amp>

Fast, Reliable, and Secure:

April 17, 2019 - 1:55 pm

By Ajit Pai | FCC Chairman

<https://www.fcc.gov/news-events/blog/2019/04/17/fast-reliable-and-secure>

Regulators have ‘tentatively approved’ a software fix for Boeing’s 737 Max airplane:

<https://www.theverge.com/2019/3/24/18279554/boeing-737-max-plane-crash-faa-mcas-automated-system-tentative-approval-for-software-update>

NovAtel Defense Solutions - Trusted NAVWAR and PNT Partners:

<https://www.youtube.com/watch?v=GnHEoQSmFkc>

Going beyond the newest generation of GPS:

<https://www.gpsworld.com/going-beyond-the-newest-generation-of-gps/>

Fallout from GPS rollover includes NOAA, Samsung, NYC, Boeing:

<https://www.gpsworld.com/fallout-from-gps-rollover-includes-noaa-stations-samsung-phones/>

Going beyond the newest generation of GPS:

<https://www.gpsworld.com/going-beyond-the-newest-generation-of-gps/>

Tell Congress to Support GPS!:

<https://www.linkedin.com/pulse/tell-congress-support-gps-dana-a-goward/>

Detecting GPS Interference from Space - Naval Research Lab:

<https://www.linkedin.com/pulse/detecting-gps-interference-from-space-naval-research-dana-a-goward/>

<https://rntfnd.org/wp-content/uploads/Detecting-GPS-Interference-from-the-ISS-Budzien.pdf>

IMPORTANT-Tesla Raises the Bar for Self-Driving Carmakers | The Official NVIDIA Blog:

<https://blogs.nvidia.com/blog/2019/04/23/tesla-self-driving/>

Texas Engineering to Host U.S. Army ‘Mad Scientist’ Conference:

<https://www.engr.utexas.edu/news/archive/8796-texas-engineering-to-host-u-s-army-mad-scientist-conference>

Google, Apple ditch college degree requirements:

<https://www.axios.com/google-apple-college-degree-hiring-a290bca8-65a7-4de2-8fa9-d93b4c30457a.html>

China Launches New Satellite as BeiDou Network Aims to Rival GPS:

<https://insidegnss.com/china-launches-new-satellite-as-beidou-network-aims-to-rival-gps/>

Samsung Electronics to invest \$9.6 billion annually in logic chips until 2030:

<https://www.moneycontrol.com/news/world/samsung-electronics-to-invest-9-6-billion-annually-in-logic-chips-until-2030-3880881.html>

USAA board chairman Lester Lyles to retire:

<https://www.bizjournals.com/sanantonio/news/2019/04/18/usaa-board-chairman-lester-lyles-to-retire.htm>

Autonomy & Positioning - Assured:

<https://www.youtube.com/watch?v=x7t48tKdM38>

<https://hxgn.biz/2DifPg1>

Assured Accurate Time - Presentations from NIST Workshop:

<https://www.linkedin.com/pulse/assured-accurate-time-presentations-from-nist-workshop-goward/>

<https://ics-cert.us->

cert.gov/sites/default/files/documents/Improving_the_Operation_and_Development_of_Global_Positioning_System_%28GPS%29_Equipment_Used_by_Critical_Infrastructure_S508C.pdf (fix this!)

<https://www.nist.gov/news-events/events/2019/03/access-assured-and-accurate-time-ii-assuredness-reference-architectures>

GPS Spoofing Mystery Affirms Need for Protection:

<https://www.wardsauto.com/industry-voices/gps-spoofing-mystery-affirms-need-protection>

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Find a hidden GPS tracker on your car:

<https://www.komando.com/tips/560375/find-a-hidden-gps-tracker-on-your-car>

How to locate a GPS tracker with a bug sweeper:

Technology doesn't only have to work against you. To turn the tables against any tracking threat, you can deploy a "bug sweeper" to find and remove them. These miniature devices use a radio receiver to catch unwanted transmissions in the act.

Keep in mind, a bug sweeper will only be useful for detecting what's called "active transmissions." This means beacons that only work when your car is moving won't be found except by locating them manually. You can purchase a variety of GPS bug sweepers from Amazon, but I personally recommend the Anti Spy RF Detector. Not only does this device find GPS trackers, but also hidden cameras and microphones that might be lurking around.

What to do if you find a GPS tracker

If you happen to find a tracker, you can usually just pull it off and throw it away. These devices are typically powered by battery and attached by magnets or tape, so removing them won't harm your vehicle. If you find one hooked into any of your car's electronics, you'll want to play it safe and visit a certified mechanic to help you. Most importantly, you'll want to contact the police and tell them any information that might help them identify who placed the tracker.

Another hidden cam found in a rental - here's how to protect yourself:

As creepy as it sounds, someone could be spying on you at your vacation rental property. There have been many examples recently of vacationers finding hidden cameras in their rooms. Don't be a victim of this hideous behavior. We've got tips on how to spot a hidden cam and what to do about it.

Tap or click to learn how to spot a hidden camera and what to do after you find one.

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Ship navigation risks: defining the threat of GPS spoofing:

GPS spoofing: what's the risk for ship navigation? <http://ow.ly/NVfF30oxjPv>

<https://www.ship-technology.com/features/ship-navigation-risks/?platform=hootsuite>

Redesign of Military Space Architecture Includes GPS:

<https://insidegnss.com/redesign-of-military-space-architecture-includes-gps/>

https://gladiatortechologies.com/?utm_content=gladiator_tech

Blue Origin: everything you need to know about the Amazon.com of space:

<https://www.techradar.com/news/everything-you-need-to-know-about-blue-origin?>

Making it safe for drones to fly over people:

<https://www.gpsworld.com/making-it-safe-for-drones-to-fly-over-people/>

<http://udds-faa.opendata.arcgis.com/>

Together with my colleagues at GSA, we have organized a special session on European GNSS technologies in the frame of the European Microwave Conference in Central Europe, Prague Congress Center, 13-15 May 2019.

FCC approves SpaceX's revised Starlink satellite plan; first wave gets set for liftoff:

<https://www.geekwire.com/2019/fcc-approves-spacexs-revised-starlink-satellite-plan-first-wave-gets-set-liftoff/>

Create your first intelligent bot with #AI, it's easier than you think. Get the details in our free e-book:

<http://msft.social/ojZ5cx>

After Pentagon Ends Contract, Top-Secret Scientists Group Vows To Carry On:

The Jasons were necessary in a time when DoD did not incorporate technology very well. Now, the Department employs thousands of scientists providing cutting edge and innovative solutions. There is still a ways to go in incorporating new technologies because there is a conservative DoD culture that yet another "Jasons' Study" will not affect. <https://lnkd.in/d65e8ab>

\<https://www.npr.org/2019/04/25/717225118/after-pentagon-ends-contract-top-secret-scientists-group-vows-to-carry-on>

GPS resilience in the face of cyber crime:

<https://www.superyachtnews.com/technology/gps-resilience-in-the-face-of-cyber-crime>

Congress to DOT Secretary - "Where is GPS Backup Demo?" - Inside GNSS:

<https://www.linkedin.com/pulse/congress-dot-secretary-where-gps-backup-demo-inside-dana-a-goward/>

<https://rntfnd.org/wp-content/uploads/Inside-GNSS-GPS-Backup-Demo.pdf>

First light: Broadcast of L1C by GPS III:

Less than three weeks after its launch, the first GPS III satellite, SVN74, started transmitting navigation signals. Learn more about the signals and what they mean. <https://lnkd.in/eVNMc8N> (Figure: Peter Steigenberger, Oliver Montenbruck, Steffen Thoelert and Richard Langley)

<https://www.linkedin.com/company/gps-world/>

<https://www.gpsworld.com/first-light-broadcast-of-l1c-by-gps-iii/>

FCC Clears SpaceX to Launch Nearly 1,600 Internet-Beaming Satellites to a Lower Orbit:

<https://gizmodo.com/fcc-clears-spacex-to-fly-nearly-1-600-internet-beaming-1834356673>

Elon Musk Was Right: Cheap Cameras Could Replace Lidar on Self-Driving Cars, Researchers Find:

"Among the many tidbits of wisdom that Elon Musk dropped at a Tesla company investor event on Monday was the revelation that Lidar, a laser-based scanning technology that images objects in 3D, was "friggin' stupid," and that "...anyone relying on LiDAR is doomed." It seemed a grandiose claim given how many autonomous car initiatives rely on the tech, but Cornell researchers have just backed up Musk's predictions with a new method for self-driving cars to see the world in 3D using a pair of cheap cameras."

An interesting read. Having been hanging around companies and researchers lately that are developing AR point cloud solutions for depth sensing with cameras, it is a very interesting and exciting space. It remains to be seen if Elon is right, or if both technologies will co-exist in an AV world, however the ride to get to that point will be very enlightening.

<https://gizmodo.com/elon-musk-was-right-cheap-cameras-could-replace-lidar-1834266742>

Visualize Test Results. Anywhere, Anytime | Explore web module features:

Want to know more about the LabVIEW web module? Read what R&D has to say about it: <http://bit.ly/2GMbLrM>

<https://forums.ni.com/t5/NI-Blog/Designing-LabVIEW-NXG-Web-Integration/ba-p/3854244?profile.language=en>

Boston among likeliest cities to lead world in technology in the next few years: Report:

Annual industry survey from KPMG sees Boston tied for ninth with Austin

<https://boston.curbed.com/2019/2/26/18240310/boston-technology-silicon-valley>

NASA will attempt to knock an asteroid out of orbit for the first time in 2022:

<https://www.businessinsider.com/nasa-will-attempt-to-knock-an-asteroid-out-of-orbit-in-2022-2019-1?>

The universe is younger and expanding faster than we thought, a new study found — and we may need new physics as a result:

<https://www.businessinsider.com/universe-younger-expanding-faster-than-thought-study-new-physics-2019-4>

Russian Spoofing - Voice of America, Ukraine, Report:

<https://www.linkedin.com/pulse/russian-spoofing-voice-america-ukraine-report-dana-a-goward/>

Recode Decode at TED: Space environmentalist Moriba Jah wants to know how much “junk” is in Earth’s orbit

Plus: Why space will be a “trillion-dollar business.”:

<https://www.recode.net/podcasts/2019/4/29/18521714/moriba-jah-ted-space-environmentalist-junk-orbit-satellites-erica-anderson-decode-podcast-interview>

Find out how a multi-antenna GNSS receiver with built-in RF spectrum monitor and adequate processing tool can efficiently detect and classify jamming events. <https://lnkd.in/gAyVUkw> (Image: Septentrio)

Highway gantries identify jammers:

<https://www.gpsworld.com/highway-gantries-identify-jammers/>

New Details On China’s KQ-200 Maritime Patrol Aircraft:

A recent video report by CCTV sheds some new light on the KQ-200 Maritime Patrol Aircraft #MPA of the People's Liberation Army Navy (PLAN or Chinese Navy) - Naval News <https://lnkd.in/gm8RrkJ>

<https://www.navalnews.com/naval-news/2019/04/new-details-on-chinas-kq-200-maritime-patrol-aircraft/>

Hacker accesses GPS and kills car engines:

<https://www.komando.com/happening-now/563934/hacker-accesses-gps-and-kills-car-engines>

US DOT GPS Backup Tech Demo - Request for Technologies:

<https://www.linkedin.com/pulse/us-dot-gps-backup-tech-demo-request-technologies-dana-a-goward/>

DOT Technology Readiness Level:

<https://www.fhwa.dot.gov/publications/research/ear/17047/17047.pdf>

Demonstration of Backup and Complementary Positioning, Navigation, and Timing (PNT) Capabilities of Global Positioning System (GPS):

RFI: Federal Register:

<https://www.federalregister.gov/documents/2019/05/03/2019-09092/demonstration-of-backup-and-complementary-positioning-navigation-and-timing-pnt-capabilities-of>

Following 'successful' laser lethality demo, MDA advances LPLD program:

<https://insidedefense.com/daily-news/following-successful-laser-lethality-demo-mdas-advances-lpld-program>

FAA Asks Foreign Regulators for Views on 737 Max Certification:

<https://www.bloomberg.com/news/articles/2019-05-03/faa-asks-foreign-regulators-for-views-on-737-max-certification>

Some FAA Inspectors Found to Lack Proper Training, Probe Reveals:

<https://www.bloomberg.com/news/articles/2019-05-03/some-faa-inspectors-found-to-lack-proper-training-probe-reveals>

Boeing CEO Says Nothing Went Wrong With Design Of 737 MAX Flight Controls:

<https://www.forbes.com/sites/jeremybogaisky/2019/04/29/boeing-ceo-says-nothing-went-wrong-with-design-of-737-max-flight-controls/#60bba4241b79>

Boeing's 737 MAX Is Too Big to Fail

Production cuts at Boeing will likely hit GDP growth this quarter, showcasing its economic heft even as complaints mount:

<https://www.wsj.com/articles/boeings-737-max-is-too-big-to-fail-11556537499>

Why not get your GNSS training directly from one of the most regarded experts in the field? Meet Dr. Chris Hegarty.

<https://lnkd.in/dHcEr75>

Intensive Intro to GNSS Concepts, Design & Operation (4-day course)

https://www.navtechgps.com/events/course_346_details/

SBG Systems debuted its Quanta UAV series, a new line of inertial navigation systems, at AUVSI's Xponential 2019, which took place April 29-May 2 in Chicago. Read more about the UAV series. <https://lnkd.in/grnciAh>

SBG Systems debuts line of inertial navigation systems at Xponential 2019:

<https://www.gpsworld.com/sbg-systems-debuts-line-of-inertial-navigation-systems-at-xponential-2019/?>

The Schwarzschild radius is the radius defining the event horizon of a black hole.

It is also the last name of the astronomer who derived it, Karl Schwarzschild, and it means "Black Shield" in German.:

<https://www.linkedin.com/feed/update/activity:6529805557044375552/>

GNSS module has inertial sensors:

<https://www.electronicsweekly.com/uncategorised/gnss-module-inertial-sensors-2019-05/>

LOW-COST SIMULATION CHANGES TRAINING PARADIGM:

<http://www.saic.com/features/virtual-simulators-in-DOD-military-training>

An array antenna for low power localization of GPS interference:

Lloyd, E. M., & Watson, R. J. (2018). An array antenna for low power localisation of GPS interference. In Proceedings of 12th European Conference on Antennas and Propagation (EuCAP), 2018 IET.

Many parties are interested in being able to locate the source of GPS interference, but most methods for locating RF emitters require large systems with high power consumption figures. In order to build a lower power system capable of finding emitters based solely on the power in the signal, a suitable antenna must be designed. In this paper three antennas are designed and simulated. They are compared based on how suitable their radiation pattern would be for locating emitters. A simple version of the best design was tested and it was found to be able to pinpoint an interfering signal with precision better than one degree and in less than a second.

<https://researchportal.bath.ac.uk/en/publications/an-array-antenna-for-low-power-localisation-of-gps-interference>

Global 5G Wireless Networks Threaten Weather Forecasts:

<https://www.scientificamerican.com/article/global-5g-wireless-networks-threaten-weather-forecasts/>

How to Grid Search SARIMA Model Hyperparameters for Time Series Forecasting in Python:

<https://machinelearningmastery.com/how-to-grid-search-sarima-model-hyperparameters-for-time-series-forecasting-in-python/>

May 2, 2000 – On this day in #GPS History: The White House deactivated “selective availability”. Selective availability added intentional time-varying errors of publicly available #navigation systems, providing civilian users with less accuracy than what was used by the military.

GPS.gov | Ending Selective Availability: In his announcement, then-President Bill Clinton said that by opening availability he wanted to “encourage acceptance and integration of GPS into peaceful civil, commercial and scientific applications worldwide.”

<https://hxgn.biz/2UYtGTr>

<https://www.gps.gov/systems/gps/modernization/sa/daley/>

From Air Force Research Laboratory: That's right, our Self-Protect High Energy Laser Demonstrator (SHIELD) Program shot down multiple air launched missiles in flight.

Check out how it happened here: <http://bit.ly/AFRLSHEILD>

Using GPS instead of maps is the most consequential exchange of technologies in history:

<https://www.alternet.org/2019/05/using-gps-instead-of-maps-is-the-most-consequential-exchange-of-technologies-in-history/>

Former U.S. officials sign open letter in support of DoD's Space Force proposal - SpaceNews.com:

“A group of 43 former Defense Department, Air Force and intelligence officials signed an open letter that expresses ‘strong support for establishing the U.S. Space Force.’” “We’re trying to answer the question of ‘why.’” Any more questions?!?!

<https://spacenews.com/former-u-s-officials-sign-open-letter-in-support-of-dods-space-force-proposal/>

Transparent Undersea: Sensors and Sonars for Complete Situational Awareness: Exploring the ocean is older than the ages, but much of the sea remains a mystery. See how sonars, sensors and lots of computer processing can help illuminate what lurks beneath the surface: <https://rtn.co/2H85qor>

<https://www.linkedin.com/company/raytheon/>

Tackling the GPS Signal Jamming Problem for Driverless Cars - Engineering & Technology Magazine:

<https://www.linkedin.com/pulse/tackling-gps-signal-jamming-problem-driverless-cars-dana-a-goward/>

<https://eandt.theiet.org/content/articles/2019/05/driverless-cars-to-see-improved-resilience-against-gps-signal-jamming-with-new-system/>

For the second consecutive year, NovAtel Inc. is proud to sponsor SAE International's #AutoDriveChallenge. This year the focus of the challenge is on urban environment driving scenarios with both static and dynamic objects. We are incredibly proud to be involved with this event and support the projects that these brilliant minds are working on.

Learn more about the competition at <https://hxgn.biz/2VvCmNx>

Why Your GPS Receiver Isn't Bigger Than a Breadbox:

<https://www.linkedin.com/pulse/why-your-gps-receiver-isnt-bigger-than-breadbox-alvin-lieberman-/>

<https://spectrum.ieee.org/geek-life/profiles/why-your-gps-receiver-isnt-bigger-than-a-breadbox>

Homeland Security Says PNT a "National Critical Function" - Inside GNSS:

<https://www.linkedin.com/pulse/homeland-security-says-pnt-national-critical-function-dana-a-goward/>

<https://www.dhs.gov/sites/default/files/publications/national-critical-functions-overview-508.pdf>

<https://www.dhs.gov/cisa/national-critical-functions>

"With our long-term NovAtel partnership, we are always able to provide our customer with better #GNSS positioning."

Learn how Brazilian #agricultural equipment manufacturer Stara S/A - Indústria de Máquinas e Implementos Agrícolas uses NovAtel products, technology and expertise to produce better yields, reduce convergence time and add more robustness to their machine operations: <https://hxgn.biz/2G3nBMz>:

<https://www.novatel.com/tech-talk/velocity/velocity-2018/powering-precision-ag/>

Seen & Heard: April 2019:

<https://www.gpsworld.com/seen-heard-april-2019/>

GPS Spoofing: What's The Risk for Ship Navigation? - Ship Technology:

<https://www.linkedin.com/pulse/gps-spoofing-whats-risk-ship-navigation-technology-dana-a-goward/>

<https://rntfnd.org/wp-content/uploads/Vanuatu-Safety-Seminar.pdf>

<https://www.ship-technology.com/features/ship-navigation-risks/>

<https://www.newscientist.com/article/2143499-ships-fooled-in-gps-spoofing-attack-suggest-russian-cyberweapon/>

<https://www.pentestpartners.com/security-blog/hacking-tracking-stealing-and-sinking-ships/>

Record-breaking satellite advances NASA's exploration of high-altitude GPS:

The four Magnetospheric Multiscale (MMS) spacecraft recently broke the world record for navigating with GPS signals farther from Earth than ever before. Find out what MMS' success means for NASA - National Aeronautics and Space Administration spacecraft. <https://lnkd.in/gu2km4b> (Image: NASA) #NASA #spacecraft #GPS #signal

<https://www.gpsworld.com/record-breaking-satellite-advances-nasas-exploration-of-high-altitude-gps/>

<https://spacenews.com/spacex-offers-new-details-on-crew-dragon-test-anomaly/>

Research on time difference detection algorithm based on combination of GNSS and PPP

Jun Yang, Ziwen ZhangEmail author, Yijun Liu, ZuoTeng Xu, Haowen Chen, Wende Zhang and Yuqiang Chen

EURASIP Journal on Wireless Communications and Networking 2019:114

<https://doi.org/10.1186/s13638-019-1416-2> © The Author(s). 2019

Received: 29 December 2018 Accepted: 26 March 2019 Published: 7 May 2019

With the gradual increase in the number of GNSS systems and the improvement of functions, in addition to the single-system navigation and timing service, the integrated navigation and positioning service among multiple systems can provide users with more accurate and stable positioning results, arousing more attention from the workers in GNSS field. Compatibility and interoperability among different systems has become a trend in the development of GNSS. Compatibility and interoperability between systems require a uniform time scale. Therefore, the measurement and forecasting of time deviations in GNSS systems is particularly important. This paper first studies the multi-system fusion location model and proposes an adaptive GNSS fusion PPP algorithm based on parameter equivalent reduction. Then, the method of fusion PPP is used to monitor the time difference of GNSS. Finally, the effectiveness of the improved algorithm and time difference monitoring method is verified by practical examples.

<https://jwcn-eurasipjournals.springeropen.com/articles/10.1186/s13638-019-1416-2>

What is GPS spoofing? And how you can defend against it

The U.S. Global Positioning System, part of a network of global navigation satellite systems (GNSS), is vulnerable to attacks that could disrupt many industries. Here's how it works and what you can do to mitigate its risk.

<https://www.csoonline.com/article/3393462/what-is-gps-spoofing-and-how-you-can-defend-against-it.html>

Insecure by design: What you need to know about defending critical infrastructure:

Patching is useless most of the time, industrial control systems (ICS) security expert tells Senate committee.

<https://www.csoonline.com/article/3260624/insecure-by-design-what-you-need-to-know-about-defending-critical-infrastructure.html>

AFRL achieves “shocking” materials technology breakthrough:

The Air Force Research Laboratory, along with research partners at Los Alamos National Laboratory, are working to change the shape of materials technology with a breakthrough development that could open up a new range of possibilities for the military and beyond. Through an Air Force Office of Scientific Research-funded basic research effort, the collaborative team developed a 3-D printed polymer-based foam structure that responds to the force of a shock wave to act as a one-way switch, a long sought-after goal in shock research. According to AFRL Senior Materials Research Engineer Dr. Jonathan Spowart, this

novel material configuration, although in the early stages of development, has the potential to be scaled up in order to be used in different ways for a variety of applications, including for the protection of structures.

<https://www.linkedin.com/pulse/afrl-achieves-shocking-materials-technology-alvin-lieberman-/>

<https://www.wpafb.af.mil/News/Article-Display/Article/1841811/afrl-achieves-shocking-materials-technology-breakthrough/>

11 Myths About GPS for Autonomous Vehicles:

GNSS's will play a fundamental role in autonomous driving, but they can not guarantee alone the availability, continuity and integrity required in such safety critical applications. The solution is, once again: integration and fusion with other navigation systems and sensors.

<https://www.electronicdesign.com/automotive/11-myths-about-gps-autonomous-vehicles>

John Betz inducted into 2019 GPS Hall of Fame - US Air Force:

GPS. It's such an integral part of our lives, you don't even need to spell it out. We just take it for granted.

But the U.S. Air Force doesn't. That's why the U.S.A.F. annually honors the pioneers behind the Global Positioning System, through its GPS Hall of Fame. Last week, the Air Force's GPS Directorate added MITRE Fellow Emeritus John Betz to the list for his groundbreaking contributions to the system that guides us home and ensures military equipment accuracy.

A note to Betz from Air Force Brig. Gen. Steven P. Whitney, director of Global Positioning Systems, describes how the Hall of Fame "recognizes individuals from industry and government for their exceptional contributions to GPS and the future of our nation's space program." The Air Force originally developed GPS and still is responsible for its development and operation.

Betz's work has addressed both civil and military aspects of GPS, along with influencing all of the world's satellite navigation systems. The plaque Betz received during the ceremony summed up his many achievements:

Dr. John W. Betz greatly contributed to modernizing the Global Positioning System, devising new signal modulations used on GPS and all other satellite-based navigation systems, and developing new theories to describe advanced receiver performance. He was a leader and technical contributor in design of the GPS Military-Code (M-Code) signal. Dr. Betz also helped design the GPS L1C signal, now used by every major worldwide GNSS system. He led a presidentially appointed team in 2015 to solve a critical national security issue with GPS. For over 25 years, U.S. Government leaders have called upon Dr. Betz's insight and knowledge to protect and improve GPS for the U.S. and the world.

A Team Player

Betz attended the induction event at the Space and Missile Systems Center in Los Angeles, home of the GPS Directorate.

"It's a great honor to be recognized in the Hall of Fame with the 'giants of GPS,'" he said

<https://www.linkedin.com/pulse/john-betz-inducted-2019-gps-hall-fame-us-air-force-dana-a-goward/>

GPS Jammers Causing Security and Time Problems Worldwide:

<https://in homelandsecurity.com/gps-jammers-problems-worldwide/>

Defense and Military GPS Applications:

We're looking forward to #CANSEC2019 later this month in Ottawa, Ontario. The two-day event is the largest and most important #defense industry event in Canada.

If you're attending, visit our booth to learn about our Global Navigation Satellite System (GNSS) product line, including precision #GNSS receivers, high-performance #antennas, augmented GNSS + Inertial positioning systems and our GAJT® #GPS Anti-Jam Technology. Learn more at <https://lnkd.in/dDuXSFH>

<https://www.linkedin.com/company/novatel/>

<https://www.novatel.com/#latestNews>

SpaceX's recent parachute tests came up short of expectations:

<https://bgr.com/2019/05/10/spacex-parachute-failure-test-nasa/>

The Future of Laser Missile Defense:

Laser weapons move literally at the speed of light, and can already defeat drones. But what would it take to be able to fry a ballistic missile? <https://rtn.co/2LrEKnW>

Resilient PNT Resource Guide - Spirent:

<https://www.linkedin.com/pulse/resilient-pnt-resource-guide-spirent-dana-a-goward/>

<https://rntfnd.org/wp-content/uploads/Robust-PNT-resource-guide-2019.pdf>

Russia says its radio-electronic shield now covers the Arctic - Barents Observer:

<https://www.linkedin.com/pulse/russia-says-its-radio-electronic-shield-now-covers-arctic-goward/>

<https://thebarentsobserver.com/en/arctic-security/2019/05/russia-says-its-radio-electronic-shield-now-covers-arctic>

Analysis of the GPS Spoofing Vulnerability in the Drone 3DR Solo - IEEE Paper:

<https://www.linkedin.com/pulse/analysis-gps-spoofing-vulnerability-drone-3dr-solo-ieee-goward/>

<https://rntfnd.org/what-we-do/our-recommendations-gps-gnss/>

<https://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=8691741>

Editorial Advisory Board PNT Q&A: Wireless in surveying:

<https://www.gpsworld.com/editorial-advisory-board-pnt-qa-wireless-in-surveying/>

Learn to scale IoT costs to fit your business needs and what it takes to get your solutions up and running. Read the interactive guide: <http://msft.social/JRqGoS>

<https://www.linkedin.com/showcase/microsoft-developers/>

AWS Ground Station satellite control system is officially open for business:

Nice article on our involvement with AWS ground stations. Great service and big savings as compared to other solutions...

<https://www.geekwire.com/2019/aws-ground-station-satellite-control-system-officially-open-business/>

Receiver architecture plays a major role in defining a receiver's robustness against the challenges, such as loss or attenuation of signals, multipath or interference. Find out how. <https://lnkd.in/eJ46gEW>

Innovation: Better jamming mitigation:

<https://www.gpsworld.com/innovation-better-jamming-mitigation/>

A Gentle Introduction to Applied Machine Learning as a Search Problem:

<https://machinelearningmastery.com/applied-machine-learning-as-a-search-problem/>

Technology is always changing and our adversaries are moving quickly. Our Applied Signal Technology team provides tactical signals intelligence (SIGINT) solutions and has expertise in areas such as high-capacity broadband communications, signal processing and analysis, wireless communications and more. If you or someone you know have experience in these areas and are looking for career advancement, join our team to help us meet the mission: <https://rtn.co/DSM AST>

The Elon Musk-Jeff Bezos feud explained.:

<https://www.linkedin.com/feed/update/activity:6537797230814904320/>

https://s3.amazonaws.com/MLMastery/ml_performance_improvement_cheatsheet.pdf?_s=kqkmd9a2dx4m9dabyn7b

Hypersonic Weapons are No Game-Changer:

Our latest #NetAssessment Podcast #warontherocks records later today. We'll review Jyri Raitasalo piece on hypersonic weapons from The National Interest "Hypersonic Weapons are No Game-Changer" <https://lnkd.in/ezi-He7> For those who tune in for the verbal jousts twixt Christopher Preble and me, be forewarned, he is hobnobbing with the global elite somewhere and won't be with us. Ryan Evans

<https://nationalinterest.org/print/blog/buzz/hypersonic-weapons-are-no-game-changer-40632>

<https://warontherocks.com/2019/05/muting-the-hype-over-hypersonics-the-offense-defense-balance-in-historical-perspective/>

GPS Anti-Jam Technology (GAJT®) | GPS Anti-Jam:

We're looking forward to #CANSEC2019 this week in Ottawa where our #defense solutions team will be at booth 513 showcasing our Global #Navigation #Satellite System (GNSS) products. Our leading-edge line includes precision #GNSS receivers, high-performance #antennas, augmented GNSS + Inertial positioning systems and our GAJT® #GPS Anti-Jam Technology, including the new GAJT®-410ML for space-constrained #military land applications.

Learn more at <https://lnkd.in/eUB68Di>

Law Allows U.S. DHS to Jam, Spoof Drones:

<https://www.linkedin.com/pulse/law-allows-us-dhs-jam-spoof-drones-dana-a-goward/>

https://www.dhs.gov/sites/default/files/publications/dhs_cuas-legalAuthorities_fact-sheet_190506-508.pdf

<https://www.govinfo.gov/content/pkg/BILLS-115hr302enr/pdf/BILLS-115hr302enr.pdf>

Astronomers fear SpaceX's 'Starlink' satellite internet service may hinder space visibility:

<https://www.techspot.com/news/80266-astronomers-fear-spacex-starlink-satellite-internet-service-may.html>

The Square Kilometer Array telescope is ten times bigger than any other in existence:

<https://www.techspot.com/news/78927-square-kilometer-array-telescope-ten-times-bigger-than.html>

Jim Farrell: "Sometimes our LinkedIn connections might believe we've forgotten them when our posts go way way down. A lot going on these days. One is a contest I entered..."

<https://lnkd.in/eJk53bN> to lift awareness of urgent problem solutions (appreciate votes from anyone who believes the work is useful). Another is a 25-page section, recently sent to publisher for the 2nd-edition GNSS book due out this year. Also two 3-day SAE-International seminars, an introductory one scheduled twice within the coming months and an advanced version, not yet fully written. Finally, co-teaching a short tutorial at Miami's September GNSS+. Bizzy bizzy ("no rest for the wicked").

<https://contest.techbriefs.com/2019/entries/medical/9578>

NovAtel reduces size of anti-jam GAJT:

NovAtel Inc. added the GAJT-410ML to its GPS Anti-Jam Technology portfolio. Read about the system, which is designed for rapid integration into space-constrained military land applications. <https://lnkd.in/e5YZNeA>

<https://www.gpsworld.com/novatel-reduces-size-of-anti-jam-gajt/>

FAA provides more access to airspace to fly drones:

<https://www.gpsworld.com/faa-provides-more-access-to-airspace-to-fly-drones/>

The Complete Guide to the 2019 LAANC Rollout:

<https://go.skyward.io/the-complete-guide-to-the-2019-laanc-rollout.html>

VRARA Enterprise Summit at LiveWorx, Boston, June 10-13: Use of VR/AR in Aviation Flight and Main...:

<https://vraraenterprisessummit.sched.com/event/Ntwi/use-of-vrar-in-aviation-flight-and-maintenance-training-in-the-us-air-force-panel>

Experts Warn Space Force Rhetoric Risks Backfiring:

This unfortunate, one side piece assumes that the rhetoric of potential adversaries and others is justified, accurate and honest while criticizing the US as instigating the militarization of space. Of course, it ignores the actual activities of these same entities. It is hard to take seriously a call for orbital standards, when potential adversaries of the US are

ignoring existing international standards both terrestrial and orbital. E.g. , Militarized man made islands in the South China Sea and debris generating ASAT tests...

The world is already treating orbit as a domain for conflict, The US ignores this and fails to do the same at its own peril.

<https://breakingdefense.com/2019/05/experts-warn-space-force-rhetoric-risks-backfiring/>

GAO in a spat with Raytheon over critical report of GPS ground control system:

<https://spacenews.com/gao-in-a-spat-with-raytheon-over-critical-report-of-gps-ground-control-system/>

ESA's NAVISP Projects Target Satellite Navigation Interference - Inside GNSS:

<https://www.linkedin.com/pulse/esas-navisp-projects-target-satellite-navigation-inside-goward/>

<https://insidegnss.com/esas-navisp-projects-target-satellite-navigation-interference/>

MDA To Suspend Redesigned Kill Vehicle Development: Report:

<https://missilethreat.csis.org/us-ends-gmd-redesigned-kill-vehicle-development/>

<https://missilethreat.csis.org/system/gmd/>

Cool New GPS Technology for Military and Civilian Mapping:

https://newsblaze.com/business/technology/cool-new-gps-technology-for-military-and-civilian-mapping_155264/?

<https://www.gpsworld.com/dual-frequency-gnss-smartphone-supports-bds-phase-iii-signal/>

FAA Finds Some Boeing 737 Aircraft May Have Defective Parts:

<https://www.finanznachrichten.de/nachrichten-2019-06/46856237-faa-finds-some-boeing-737-aircraft-may-have-defective-parts-020.htm>

GPS Jammers Causing Security and Time Problems Worldwide - HomelandSecurity.com:

<https://www.linkedin.com/pulse/gps-jammers-causing-security-time-problems-worldwide-dana-a-goward/>

<https://inhomelandsecurity.com/gps-jammers-problems-worldwide/>

How GPS III is performing in orbit:

<https://www.gpsworld.com/how-gps-iii-is-performing-in-orbit/>

Johns Hopkins APL Software Helps DARPA Test UAVs in GPS-Denied Areas:

<https://blog.executivebiz.com/2019/05/johns-hopkins-apl-software-helps-darpa-test-uavs-in-gps-denied-areas/>

How AI is Starting to Influence Wireless Communications:

<https://spectrum.ieee.org/computing/software/how-ai-is-starting-to-influence-wireless-communications>

OmniSIG™ Sensor:

<https://www.deepsig.io/omnisig>

SARA scores at football match:

The SARA Project just conducted a test in Italy at a recent football match. The GSA funded search and rescue solution uses #Galileo for surveillance operations, but the economic viability of the solution in other fields such as sports is being assessed.

<https://www.gsa.europa.eu/newsroom/news/sara-scores-football-match>

GPS Jamming Central London This Week - 11 Mile Radius:

<https://www.linkedin.com/pulse/gps-jamming-central-london-week-11-mile-radius-dana-a-goward/>

Law Allows U.S. DHS to Jam, Spoof Drones:

<https://www.linkedin.com/pulse/law-allows-us-dhs-jam-spoof-drones-dana-a-goward/>

<https://www.govinfo.gov/content/pkg/BILLS-115hr302enr/pdf/BILLS-115hr302enr.pdf>

DOE, INL Release Cybersecurity Tool for Electric Grid:

<https://www.executivegov.com/2019/06/doe-inl-release-cybersecurity-tool-for-electric-grid/>

One year ago today, #NorthropGrumman and Orbital ATK became one company, creating the Innovation Systems sector.

Take a look at a few highlights from the past year, and learn more about the sector on our website:

<http://ms.spr.ly/6043TJbKV>

GPS System For Space To Help Spacecraft Orientate:

<https://www.valuewalk.com/2019/06/gps-system-for-space-spacecraft-orientate/>

Daily GPS Jamming in Zagreb, Croatia:

<https://www.linkedin.com/pulse/daily-gps-jamming-zagreb-croatia-dana-a-goward/>

<https://navcen.uscg.gov/?Do=GPSReportStatus>

Cool Gas Circles the Milky Way's Supermassive Black Hole:

A new study reveals surprising new details about our galaxy's shadowy core

<https://www.scientificamerican.com/article/cool-gas-circles-the-milky-ways-supermassive-black-hole1/?redirect=1>

Google rewards reputable reporting more than left-wing politics:

<https://www.economist.com/graphic-detail/2019/06/08/google-rewards-reputable-reporting-more-than-left-wing-politics>

For the past five weeks, we have been looking back over 50 years of Continuous At Sea Deterrent #CASD50. At BAE Systems we are honoured to stand side-by-side with the Royal Navy and are proud of our heritage in manufacturing and engineering excellence, of our role in delivering the world's most advanced and complex defence programmes and of the dedication, passion and innovation of our people.

Today, our work on the Dreadnought programme represents one of the world's most advanced #engineering challenges and will mark a step change in submarine design and #technology when the first in class enters service in the 2030s. We are #proudtosupport our submariners and play a vital role in the delivery of this next generation deterrent.

Find out more, here: <http://baes.co/tZbo50uxUMF>

Swarm of 105 tiny Sprite ChipSats successfully deployed:

<https://newatlas.com/sprite-chipsat-swarm-deployed/59994/>

"GNSS & the Law", new article on cyber operations against GNSS:

<https://www.linkedin.com/pulse/gnss-law-new-article-cyber-operations-against-ingobbaumann/>

Could a space-based sensor layer help stop missile attacks?:

<https://www.c4isrnet.com/c2-comms/satellites/2019/05/23/could-a-space-based-sensor-layer-help-stop-missile-attacks/>

Eyeing Russia, Army fields jam-resistant GPS in Europe:

https://www.c4isrnet.com/show-reporter/c4isrnet-conference/2019/06/06/eyeing-russia-army-fields-jam-resistant-gps-in-europe/?utm_source=clavis

NASA is opening the space station to \$35,000-a-night visits. A tourist who paid Russia \$30 million to get there a decade ago says it's a 'seismic shift.':

<https://www.businessinsider.com/nasa-international-space-station-commercialization-tourists-2019-6>

RNTF President Reappointed to NASA Panel:

<https://www.linkedin.com/pulse/rntf-president-reappointed-nasa-panel-dana-agoward/>

<https://fas.org/irp/offdocs/nspd/nspd-39.htm>

<https://www.gps.gov/governance/advisory/>

Raytheon and United Technologies aerospace businesses have agreed to combine in a merger of equals. Raytheon Technologies will be a premier systems provider with a powerful R&D platform to deliver value to both customers and shareholders. <https://rtn.co/2WRj9K4>

Drone Ops: Leveraging Professional Services:

https://go.skyward.io/Drone-Ops-Leveraging-Professional-Services.html?utm_source=linkedin&utm_medium=social&utm_campaign=ProServwebinar

How spacetime is built by quantum entanglement:

https://www.eurekalert.org/pub_releases/2015-05/uo-t-hsi052715.php?fbclid=IwAR2YYCr3-HCc3Jg3ssp2j5zxARnbZsSCNN6pEhjdnn663WE91AF3OzX8288#.XP0gN4brpmC.linkedin

Physicists Have Finally Figured Out a Way to Save Schrödinger's Cat:

<https://www.sciencealert.com/physicists-have-figured-out-a-way-to-save-schroedinger-s-cat-from-its-uncertain-demise>

CERN pays tribute to Murray Gell-Mann:

<https://www.linkedin.com/pulse/cern-pays-tribute-murray-gell-mann-alvin-lieberman-/>

NATO Fears Russia Jamming Its GPS Systems in a War. They Might Have a Solution.:

<https://nationalinterest.org/blog/buzz/nato-fears-russia-jamming-its-gps-systems-war-they-might-have-solution-61437>

Finland, Norway press Russia on suspected GPS jamming during NATO drill:

<https://www.defensenews.com/global/europe/2018/11/16/finland-norway-press-russia-on-suspected-gps-jamming-during-nato-drill/>

How to improve a website's Google ranking:

<https://www.techradar.com/how-to/how-to-improve-a-websites-google-ranking>

Hundreds Of U.S. Flights Canceled As GPS-Based Aircraft Navigation System Fails::

<https://www.forbes.com/sites/zakdoffman/2019/06/09/hundreds-of-u-s-flights-canceled-as-gps-based-aircraft-navigation-system-fails/#7da50fb3878a>

Smart materials just got smarter:

<https://www.linkedin.com/pulse/smart-materials-just-got-smarter-alvin-lieberman-/>

GPS Degraded Across Much of US, ADS-B Impacted:

<https://www.linkedin.com/pulse/gps-degraded-across-much-us-ads-b-impacted-dana-a-goward/>

<https://navcen.uscg.gov/?Do=GPSReportStatus>

GPS Fault Reports Received by National Coordination Center and USCG Navigation Center

25- 26 January 2016 GPS SVN23 Anomaly:

<https://rntfnd.org/wp-content/uploads/3.-Fault-Reports.pdf>

GPS AND ADS-B PROBLEMS CAUSE CANCELLED FLIGHTS:

<https://hackaday.com/2019/06/09/gps-and-ads-b-problems-cause-cancelled-flights/>

Hundreds Of U.S. Flights Canceled As GPS-Based Aircraft Navigation System Fails:

<https://www.forbes.com/sites/zakdoffman/2019/06/09/hundreds-of-u-s-flights-canceled-as-gps-based-aircraft-navigation-system-fails/#2d0c436a3878>

"Chinese Exporters Dodge Tariffs With Fake Made-in-Vietnam Labels"

<https://www.bloomberg.com/news/articles/2019-06-10/vietnam-cracks-down-on-chinese-made-goods-being-shipped-to-u-s?fbclid=IwAR276EK9g6OBw3EeCn8JcclxxCCLFUjTDlpy0Mfacbs9xrWsARAFe72amJ8>

Not a GPS Signal Problem - Corrupted Receiver Update:

<https://www.linkedin.com/pulse/probably-gps-signal-problem-seems-corrupted-receiver-dana-a-goward/>

<https://www.ainonline.com/aviation-news/business-aviation/2019-06-10/collins-gps-receivers-suffer-reception-outage>

GPS Degraded Across Much of US, ADS-B Impacted:

<https://www.linkedin.com/pulse/gps-degraded-across-much-us-ads-b-impacted-dana-a-goward/>

GPS AND ADS-B PROBLEMS CAUSE CANCELLED FLIGHTS:

<https://hackaday.com/2019/06/09/gps-and-ads-b-problems-cause-cancelled-flights/>

Can artificial intelligence improve aerial dogfighting?:

The first solicitation for DARPA's ACE program is on the street. ACE will transform how we build trust in AI and improve human-machine teaming in complex environments.

Also stay-tuned for information about the "AlphaDogfight Trials":

<https://www.c4isrnet.com/artificial-intelligence/2019/06/07/can-artificial-intelligence-improve-aerial-dogfighting/>

American Airlines extends Boeing 737 MAX cancellations until September:

About 115 daily flights have been cancelled at largest US airline since grounding of 737s:

<https://www.irishtimes.com/business/transport-and-tourism/american-airlines-extends-boeing-737-max-cancellations-1.3920094>

Dashing the dream of ideal 'invisibility' cloaks for stress waves:

<https://www.linkedin.com/pulse/dashing-dream-ideal-invisibility-cloaks-stress-waves-lieberman-/>

Laser Interferometer Gravitational-Wave Observatory:

Cataclysms are rattling the fabric of space and time. How will gravitational waves help decipher mysteries of the universe? <http://ms.spr.ly/6044TJYVs>

NASA intends to waste billions on a 'Lunar Orbit Tollbooth.' Private spacecraft could put boots on the moon faster and cheaper.:

<https://spacenews.com/op-ed-lunar-gateway-or-moon-direct/>

A rare moment of truth from a politician who breaks down how the whole #banking system is nothing but a huge scam!

I know this was done some time ago but it is most important that all should know. This is why corporations team up with other big corporations to fiddle the system. Like insurance fraud In its #Billions if not #Trillions. How I know this is I have documentation to prove this fact! Then they hide the real documentation in secret places so no one would be none of the wiser. Well, These corporations certainly f... up when their corporate solicitors sent me these documents. (All in a safe place for the high courts!!) They have NO money! All orchestrated by the City of London! who own the treasonous self-serving parasite politicians, and come under different laws. Their own laws. Not the Law of the land.

Two things happened recently to throw a spanner in the Jesuit orders fascist totalitarian new world order complete take over plans, one was Trump being elected president of America! The other was the people of Britain voting by the majority to leave their Jesuit owned and controlled European Union.

This is why I would like to be helped to fund my case.

<https://lnkd.in/duy5e2v>

<https://hackaday.com/2019/06/09/gps-and-ads-b-problems-cause-cancelled-flights/>

House 2020 NDAA Includes \$32M for More PNT Resilience:

<https://www.linkedin.com/pulse/house-2020-ndaa-includes-32m-more-pnt-resilience-dana-a-goward/>

Apart from some critical onboard items, such as the atomic clocks, the ground segment is always key for the good performance of a GNSS:

Air Force gets new stopgap system for GPS 3 satellites:

<https://www.c4isrnet.com/battlefield-tech/c2-comms/2019/06/11/air-force-gets-new-stopgap-system-for-gps-3-satellites/>

Lockheed delivers GPS III ground system upgrade, SV03 ready for launch - GPS World:

Lockheed Martin delivered the GPS III Contingency Operations software upgrade to the U.S. Air Force's current GPS ground control system. Find out what this upgrade means for the new, next generation GPS III satellites.

<https://www.gpsworld.com/lockheed-delivers-gps-iii-ground-system-upgrade-sv03-ready-for-launch/>

Long Delay for Chimera Indicates Possible GPS & PNT Leadership Shortfall - Inside GNSS:

<https://www.linkedin.com/pulse/long-delay-chimera-indicates-possible-gps-pnt-shortfall-goward/>

<https://insidegnss.com/long-delay-for-chimera-indicates-possible-gps-pnt-leadership-shortfall/>

<https://www.gps.gov/governance/advisory/meetings/2019-06/scott.pdf> (An important and insightful presentation!)

Pramod Khargonekar Vice Chancellor for Research and Distinguished Professor of Electrical Engineering and Computer Science at UC Irvine

I am just returning from Boston where Meera Sampath and I participated in the EmTech Next Conference organized by the MIT Technology Review. The theme of the conference was automation and work. We gave a presentation on our work on Socially Responsible Automation (which came out earlier in the NAE Bridge Magazine a few months ago.) Lots of excellent presentations at this conference touching on various aspects of automation, machine learning, artificial intelligence, jobs, tasks, work, education, reskilling, regional and community impacts, role of regulation and policy, etc. It is indeed a very big topic, likely to become even more important. Our slides are posted at

<https://faculty.sites.uci.edu/khargonekar/presentations/>

The new DG of Internal Market, Industry, Entrepreneurship and SMEs, Timo Pesonen, visited the GSA's HQ in Prague. He experienced first-hand what it means to “link space to user needs”, through a virtual Mountain Rescue using Galileo’s SAR capabilities & a drone flight demonstration by the GSA funded SARA project. He also had the chance to see how EGNOS & Galileo make a difference in #precisionagriculture with the help of a CNH Industrial tractor.:.

<https://www.linkedin.com/feed/update/urn:li:activity:6544488805661978624/>

<https://www.linkedin.com/company/cnh/>

Globalstar, Echo Ridge Offer GPS Backup Tech to DOT - Via Satellite:

<https://www.satellitetoday.com/government-military/2019/06/13/globalstar-echo-ridge-offer-gps-backup-tech-to-dot/>
(see top)

Microsemi Develops Firewall Against GPS Spoofing and Jamming:

<https://www.satellitetoday.com/government-military/2019/06/13/globalstar-echo-ridge-offer-gps-backup-tech-to-dot/>
(see further down)

Study finds that a GPS outage would cost \$1 billion per day:

<https://arstechnica.com/science/2019/06/study-finds-that-a-gps-outage-would-cost-1-billion-per-day/>

<https://www.gps.gov/governance/advisory/meetings/2019-06/parkinson.pdf>

Argentina Isn't Ruling Out a Cyberattack in Major Power Outage:

<https://www.bloomberg.com/news/articles/2019-06-16/massive-power-failure-sweeps-across-argentina-and-uruguay>

Millions Without Power in Argentina, Paraguay, Uruguay:

<https://www.voanews.com/americas/millions-without-power-argentina-paraguay-uruguay>

The Latest: Argentine state news agency: power 90% restored:

https://www.washingtonpost.com/world/the_americas/the-latest-edesur-power-restored-to-15-million-argentines/2019/06/16/808b1210-9060-11e9-956a-88c291ab5c38_story.html?noredirect=on&utm_term=.f0a8f831a509

United Technologies Stock Has Fallen Too Far, Analyst Says:

<https://www.barrons.com/articles/united-technologies-stock-upgrade-fallen-too-far-analyst-says-51560533217>

Controversy on Way Forward for GNSS Receiver Resilience - SAE Could Be Way Forward:

<https://www.linkedin.com/pulse/controversy-way-forward-gnss-receiver-resilience-sae-dana-a-goward/>

<https://rntfnd.org/what-we-do/our-recommendations-gps-gnss/>

RNT Foundation Latest News: Long Delay for Chimera Indicates Possible GPS & PNT Leadership Shortfall – Inside GNSS (6/13/2019):

<https://us3.campaign-archive.com/?e=c14e45c70d&u=06a79dfa9d702640cd0cee682&id=f4fdeff679>

<https://insidegnss.com/long-delay-for-chimera-indicates-possible-gps-pnt-leadership-shortfall/>

Gruber to Take over GPS Wing Leadership:

<https://insidegnss.com/gruber-to-take-over-gps-wing-leadership/>

<https://insidegnss.com/bernard-gruber-to-assume-usaf-gps-wing-command-new-direction-in-store/>

Boeing to Deliver First Two F-15EX Fighters As Soon as 2020:

<https://news.yahoo.com/boeing-deliver-first-two-f-230000869.html>

<https://nationalinterest.org/blog/buzz/boeing-deliver-first-two-f-15ex-fighters-soon-2020-61757>

Raytheon and Black Sage team to deliver counter-drone tech:

<https://www.prnewswire.com/news-releases/raytheon-and-black-sage-team-to-deliver-counter-drone-tech-300869453.html>

Jammers at dachas add to Russia's ability to silence GPS:

<https://www.gpsworld.com/jammers-at-dachas-add-to-russias-ability-to-silence-gps/?>

'We spoofed a Tesla and really scared our co-worker!' - Regulus Cyber:

<https://www.linkedin.com/pulse/we-spoofed-tesla-really-scared-our-co-worker-regulus-dana-a-goward/>

<https://rntfnd.org/wp-content/uploads/Regulus-PPT-to-PNT-AB.pdf>

Jammers at dachas add to Russia's ability to silence GPS – GPS World:

<https://www.linkedin.com/pulse/jammers-dachas-add-russias-ability-silence-gps-world-dana-a-goward/>

Drone Shoot Down - Did Iran Spoof It Then Shoot It?

<https://www.linkedin.com/pulse/drone-shoot-down-did-iran-spoof-dana-a-goward/>

https://www.washingtonpost.com/world/irans-foreign-minister-tweets-images-he-saysleaves-no-doubt-us-drone-was-over-iranian-airspace/2019/06/22/38f8ee08-94f8-11e9-956a-88c291ab5c38_story.html?utm_term=.90023f5e02b8

United Nations Office for Outer Space Affairs (UNOOSA):

What a fabulous moment for the Committee on the Peaceful Uses of Outer Space and all the experts who put years of effort into the negotiations.

<https://www.facebook.com/UNOOSA/photos/a.387202358024178/2285130138231381/?type=3&theater>

Today #COPUOS adopted voluntary guidelines 4 the long-term sustainability of outer space activities: they cover policy & regulatory framework for #space activities; safety of space operations; International cooperation, capacity-building & awareness; & scientific & technical research and development

378 Years Ago Today: Galileo Forced to Recant

Read more: <https://www.smithsonianmag.com/smithsonian-institution/378-years-ago-today-galileo-forced-to-recant-18323485/#DCBJ0J0LaJo1IX8q.99>

<https://www.smithsonianmag.com/smithsonian-institution/378-years-ago-today-galileo-forced-to-recant-18323485/>

NASA Seeks Wider Use of GPS: Not From Space, but in Space - Via Satellite:

<https://www.satellitetoday.com/government-military/2019/06/21/nasa-seeks-wider-use-of-gps-not-from-space-but-in-space/>

South Korea, Japan to Plus-Up Position, Navigation, and Timing Satellite Systems

Create your first intelligent both with AI, it's easier than you think. Get the details in our free e-book:

<http://msft.social/vsnIG2>

Claims of Tesla hack wide of the mark—we dig into GNSS hacking:

<https://arstechnica-com.cdn.ampproject.org/c/s/arstechnica.com/cars/2019/06/claims-of-tesla-hack-wide-of-the-mark-we-dig-into-gnss-hacking/?amp=1>

<https://arstechnica.com/cars/2019/06/claims-of-tesla-hack-wide-of-the-mark-we-dig-into-gnss-hacking/>

U.S. Army to equip light armored vehicles with new GPS anti-jam units - GPS World:

The U.S. Army will send prototype anti-jamming systems to its 2nd Cavalry Regiment, stationed in Europe, in September to aid forces under GPS jamming or spoofing conditions. Get more details.

<https://www.gpsworld.com/u-s-army-to-equip-light-armored-vehicles-with-new-gps-anti-jam-units/>

Hackers Used a Cheap Raspberry Pi Computer to Breach NASA:

<http://fortune.com/2019/06/20/hackers-raspberry-pi-computer-nasa/>

US cyberattack reportedly knocked out Iran missile control systems:

<https://www.engadget.com/2019/06/22/us-cyberattack-reportedly-knocked-out-iran-missile-control-syste/?ypr=yahoo>

Drone Shoot Down – Did Iran Spoof It Then Shoot It?

A bit unlikely that a \$220 M drone was not equipped with anti-spoofing measures and with backup navigation systems.

<https://rntfnd.org/2019/06/22/drone-shoot-down-did-iran-spoof-it-then-shoot-it/>

Raytheon, Northrop Grumman partner on hypersonic missile system:

<https://www.upi.com/Defense-News/2019/06/18/Raytheon-Northrop-Grumman-partner-on-hypersonic-missile-system/9531560863841/>

Scientists have discovered a sea of fresh water under the ocean:

<https://qz.com/1650613/scientists-discover-sea-of-fresh-water-under-the-ocean/>

<https://phys.org/news/2019-06-scientists-huge-undersea-fresh-water-aquifer.html>

Spoofing a Tesla - Ars Technica Not Impressed, Regulus Will Discuss in Webinar:

<https://www.linkedin.com/pulse/spoofing-tesla-ars-technica-impressed-regulus-discuss-goward/>

Claims of Tesla hack wide of the mark—we dig into GNSS hacking:

<https://arstechnica.com/cars/2019/06/claims-of-tesla-hack-wide-of-the-mark-we-dig-into-gnss-hacking/>

DOT ignoring GPS vulnerabilities — again:

<https://www.gpsworld.com/dot-ignoring-gps-vulnerabilities-again/>

Controversy on Way Forward for GNSS Receiver Resilience – SAE Could Be Way Forward:

<https://rntfnd.org/2019/06/17/controversy-on-way-forward-for-gnss-receiver-resilience-sae-could-be-way-forward/>

<https://www.gps.gov/governance/advisory/meetings/2019-06/zimmerman.pdf>

Claims of Tesla hack wide of the mark—we dig into GNSS hacking:

<https://arstechnica.com/cars/2019/06/claims-of-tesla-hack-wide-of-the-mark-we-dig-into-gnss-hacking/>

Germany to close all 84 of its coal-fired power plants, will rely primarily on renewable energy:

<https://www.latimes.com/world/europe/la-fg-germany-coal-power-20190126-story.html>

Trump administration rewrites coal emissions rules in a boon for heavily polluting facilities:

<https://www.latimes.com/politics/la-na-pol-essential-washington-updates-trump-plan-scales-back-obama-s-coal-1534862653-htmlstory.html>

VIDEO: The Foundation and Future of GPS with Dr. Brad Parkinson (No Registration or Email Required):

In April we were honoured to welcome Dr. Brad Parkinson, the chief architect of the GPS network, to the Hexagon Campus in Calgary. During his visit, Dr. Parkinson toured our facilities and gave our team an inspiring presentation on the past, present and future of the #GPS industry.

Dr. Parkinson's presentation is now available for your viewing on demand on our website. You won't want to miss out on the key insights from Dr. Parkinson, whose contributions to the industry have stimulated innovation that has impacted nearly every aspect of our modern day lives.

https://www.novatel.com/brad-parkinson-gps-presentation?utm_source=novatel-website&utm_campaign=brad_parkinson

Maritime Groups Call for International Resolution Against Jamming & Spoofing - Inside GNSS:

<https://insidegnss.com/maritime-groups-call-for-international-resolution-against-jamming-spoofing/>

<https://static1.squarespace.com/static/566ef8b4d8af107232d5358a/t/5c99488beb39314c45e782da/1553549492554/ABove+Us+Only+Stars.pdf>

Northrop Grumman awarded \$163.6M to support Army's Hunter drone:

<https://www.upi.com/Defense-News/2019/05/13/Northrop-Grumman-awarded-1636M-to-support-Armys-Hunter-drone/9591557749592/>

Defense Department, Lockheed Eye Expansion Of F-35 Modernization Plan:

<https://aviationweek.com/combat-aircraft/defense-department-lockheed-eye-expansion-f-35-modernization-plan>

Raytheon's Joint Precision Approach and Landing System (JPALS):

Our Matt Gilligan discusses how JPALS can help #military pilots land their aircraft in the most difficult conditions anywhere in the world. <https://rtn.co/2X2Tdfg>

Israel says GPS mysteriously disrupted in its airspace but planes secure - Reuters:

<https://www.linkedin.com/pulse/israel-says-gps-mysteriously-disrupted-its-airspace-planes-goward/>

<https://www.reuters.com/news/archive/worldNews>

<https://www.reuters.com/article/us-israel-aviation/israel-says-gps-mysteriously-disrupted-in-its-airspace-but-planes-secure-idUSKCN1TR1O3>

<https://www.haaretz.com/israel-news/israel-says-gps-mysteriously-disrupted-in-its-airspace-but-planes-secure-1.7413357>

Keeping Tel Aviv's Tiny Airport Open Could Cost Nearly \$17 Billion:

<https://www.haaretz.com/israel-news/business/.premium-keeping-tel-aviv-s-tiny-airport-open-could-cost-nearly-17-billion-1.7403739>

NovAtel Manager, Dr. Dean Kemp, will be joining speakers from Orolia today at 1:00 pm EDT as a presenter in a free GPS World magazine webinar. Dr. Kemp will be explaining Controlled Reception Pattern

(CRPAs) and the basics of Anti-Jam Antenna Systems (AJAS).

Details on the methods used to test them, including simulation system configurations, calibration techniques and use case examples will also be presented during this informative presentation.

Sign up at <https://hxgn.biz/2KJGDdM>

Advanced Simulation Test Systems for Controlled Reception Pattern Antennas

<https://event.on24.com/eventRegistration/EventLobbyServlet?target=lobby20.jsp&eventid=2006509&sessionid=1&key=30F870FC8F809C78526F253E7BD8D7E1&eventuserid=242930160>

Russia denies role in Israeli airport GPS jamming - BBC News:

<https://www.linkedin.com/pulse/russia-denies-role-israeli-airport-gps-jamming-bbc-news-goward/>

<https://www.bbc.com/news/technology-48786085>

Boeing's 737 Max Software Outsourced to \$9-an-Hour Engineers:

In an effort to save a few dollars, Boeing has caused the deaths of hundreds of people and opened itself to massive lawsuits. How did that work out for you Boeing?

<https://www.bloomberg.com/news/articles/2019-06-28/boeing-s-737-max-software-outsourced-to-9-an-hour-engineers>

Draper Signs Collaboration Agreement with Bristol-Myers Squibb | Draper:

We're proud to announce collaboration with Bristol-Myers Squibb to make preclinical drug testing more predictive with our Human Organ Systems technology.

NASA Eyes GPS at the Moon for Artemis Missions:

<https://www.nasa.gov/feature/goddard/2019/nasa-eyes-gps-at-the-moon-for-artemis-missions>

https://www.nasa.gov/sites/default/files/atoms/files/spring_2019_final_web_version.pdf

China launches new BeiDou satellite:

https://www.youtube.com/watch?v=7_7F5ze4Feg&feature=youtu.be

Glossary of GPS Terms:

https://www.novatel.com/support/knowledge-and-learning/published-papers-and-documents/glossary-of-terms/?utm_source=%3Dgnss-glossary

New to the industry? Our GNSS Glossary explains many of the key terms used in the field. <https://hxgn.biz/2NHK6g3>

As U.S. Forces Gather Near Iran (Think F-22s and F-35s), Russia Jams Their GPS! Not good:

<https://nationalinterest.org/blog/buzz/us-forces-gather-near-iran-think-f-22s-and-f-35s-russia-jams-their-gps-65196>

Congressman DeFazio: 'GPS backup vital for national security' - GPS World:

<https://www.linkedin.com/pulse/congressman-defazio-gps-backup-vital-national-security-dana-a-goward/>

<https://www.gpsworld.com/congressman-defazio-gps-backup-vital-for-national-security/>

Deep Space Atomic Clock (DSAC): Space Tech Timekeeper for Artemis Missions:

<https://www.linkedin.com/pulse/deep-space-atomic-clock-dsac-tech-timekeeper-artemis-lieberman-/>

<https://www.nasa.gov/directories/heo/scan/engineering/technology/dsac>

Hackers are repeatedly targeting Navy contractors:

https://www.fifthdomain.com/industry/2019/06/27/hackers-are-repeatedly-targeting-navy-contractors/?utm_source=Sailthru&utm_medium=email&utm_campaign=Daily%207.2&utm_term=Editorial%20-%20Daily%20Brief

New report explains how China thinks about information warfare:

<https://www.c4isrnet.com/c2-comms/2019/05/03/new-report-explains-how-china-thinks-about-information-warfare/>

Navy, Industry Partners Are 'Under Cyber Siege' by Chinese Hackers, Review Asserts:

<https://www.wsj.com/articles/navy-industry-partners-are-under-cyber-siege-review-asserts-11552415553>

New leader wants Cyber Command to be more aggressive:

<https://www.fifthdomain.com/dod/cybercom/2018/07/23/new-leader-wants-cyber-command-to-be-more-aggressive/>

<https://www.cybercom.mil/Portals/56/Documents/USCYBERCOM%20Vision%20April%202018.pdf?ver=2018-06-14-152556-010>

Is Cyber Command really being more ‘aggressive’ in cyberspace?:

<https://www.fifthdomain.com/dod/2019/04/25/is-cyber-command-really-being-more-aggressive-in-cyberspace/>

U.S. Cyber Command operation disrupted Internet access of Russian troll factory on day of 2018 midterms:

https://www.washingtonpost.com/world/national-security/us-cyber-command-operation-disrupted-internet-access-of-russian-troll-factory-on-day-of-2018-midterms/2019/02/26/1827fc9e-36d6-11e9-af5b-b51b7ff322e9_story.html?utm_term=.3800dd7dead9

Chinese attacks on contractors ‘a phenomenon’ on the rise:

<https://www.fifthdomain.com/critical-infrastructure/2018/06/12/chinese-attacks-on-contractors-a-phenomenon-on-the-rise/>

Upcoming astronomical events:

Summer is bringing spectacular astronomical views. Here's your night sky guide for 2019:

<http://ms.spr.ly/6042TKtZC hashtag#NorthropGrumman>

The Moon Landing’s 50th Anniversary and What it Means for Product Technology:

<https://www.embedded-computing.com/latest-blogs/the-moon-landing-s-50th-anniversary-and-what-it-means-for-product-technology>

What are the biggest barriers to autonomous driving?:

If driverless cars help to reduce the number of fatal road crashes by 50%, is that sufficient? - Chris Bessette asking the tough questions in an op-ed for Automotive Testing Technology International:

<https://www.automotivetestingtechnologyinternational.com/industry-opinion/what-are-the-biggest-barriers-to-autonomous-driving.html>

Ben Gurion Incident Exposes West's Vulnerability to GPS Disruption - Voice of America:

<https://www.linkedin.com/pulse/ben-gurion-incident-exposes-wests-vulnerability-gps-dana-a-goward/>

<https://www.linkedin.com/pulse/ben-gurion-incident-exposes-wests-vulnerability-gps-dana-a-goward/>

<https://www.voanews.com/europe/angry-norway-says-russia-jamming-gps-signals-again>

Congressman DeFazio: ‘GPS backup vital for national security’ – GPS World:

<https://rntfnd.org/2019/07/02/congressman-defazio-gps-backup-vital-for-national-security-gps-world/>

<https://www.congress.gov/bill/115th-congress/senate-bill/140/text#toc-id89e563a8d5524c5a84cacf66865f7ba1>

Manager, GNSS Tracking:

We're looking for a dynamic individual to lead our #GNSS Tracking team in Calgary, within the #Geomatics Department. The primary focus of this role is to provide exceptional functional and technical leadership of our team of world-class #engineers working on GNSS signal tracking technologies.

In addition to leading the team, you will work collaboratively with a multi-disciplinary group of managers, team leads and engineers across the Engineering, Sales, Product Management and Research organizations, supporting ongoing business initiatives in our exciting high-tech environment.

Learn more and submit your resume online at <https://hxgn.biz/32aOqYk>

<https://careers-hexagonpositioning.icims.com/jobs/1560/manager,-gnss-tracking/job?mobile=false&width=1148&height=500&bga=true&needsRedirect=false&jan1offset=-300&jun1offset=-240>

As the Manager, GNSS Tracking you will:

Provide functional management and technical leadership of the team

Keep current on GNSS industry technology developments and challenges and anticipate actions to meet these

Drive the GNSS signal tracking roadmap

Work collaboratively and build relationships with stakeholders in Engineering, Product Management, Sales and Applied Research to identify, prioritize, plan and resource tasks.

Develop, communicate and execute plans efficiently with team buy in

Drive a culture of initiative, innovation, accountability, quality and continuous improvement

Build and develop the team's skills through personal skills development, continuous improvement initiatives, and knowledge transfer

Anticipate and organize education and training of the team, with both external and internal sources

Provide frequent performance feedback, coaching, career growth

Represent the team and its interests in management meetings and initiatives

Generate and communicate a compelling vision for the team

Have overall accountability for the team's actions and results

Qualifications

Must-Have:

3+ years in a technical management or functional leadership role

3+ years in a development or research role specifically related to GNSS tracking

Proven ability to develop a vision and plans that translate industry trends into practical work

Advanced knowledge of GNSS signal tracking technology and how it relates to adjacent technologies, e.g. RF and positioning. You will be relying on technical experts in the team for detailed knowledge of architecture and algorithms.

Exposure to global work practices and international collaboration

Degree in geomatics engineering, software engineering, electrical engineering, or a related technical field

Excellent organizational and planning abilities and can clearly communicate ideas and solutions to others.

Key Success Factors:

Excellent people and team leadership skills.

Self starter - can see what needs to be done and does it.

Effective and efficient decision making taking into account what's best for Hexagon PI.

Innate sense of curiosity and conscientiousness.

Excited by new technologies and new possibilities.

Inherent desire for producing high quality work and continuous improvement.

Strong written and verbal communication skills.

Nice-to-Have:

Strong knowledge and understanding of GNSS receiver architecture.

Field experience with GNSS applications.

Experience with real time operating systems and embedded firmware development.

Check out the work of this body painting illusionist. <https://chdr.tv/hdf>

<http://www.astronomy.com/magazine/2019/06/tension-at-the-heart-of-cosmology?>

Waymo is now allowed to transport passengers in its self-driving vehicles on California roads:

Very proud of our team's work on achieving this milestone in California. "The CPUC permit allows us to participate in their pilot program, giving Waymo employees the ability to hail our vehicles and bring guests on rides within our South Bay territory. This is the next step on our path to eventually expand and offer more Californians opportunities to access our self-driving technology, just as we have gradually done with Waymo One in Metro Phoenix."

<https://www.linkedin.com/feed/update/urn:li:activity:6551912612098113536/>

<https://techcrunch.com/2019/07/02/waymo-is-now-allowed-to-transport-passengers-in-its-self-driving-vehicles-on-california-roads/>

NASA is Developing GPS for Navigation on the Moon:

<https://www.technowize.com/nasa-is-developing-gps-for-navigation-on-the-moon/>

Ben Gurion Incident Exposes West's Vulnerability to GPS Disruption:

<https://www.voanews.com/silicon-valley-technology/ben-gurion-incident-exposes-wests-vulnerability-gps-disruption>

Why Would Russia Spoof Israeli GPS? F-35 & Iran:

<https://breakingdefense.com/2019/06/if-russia-is-spoofing-israeli-gps-then-why-iran-f-35/>

Electronic Warfare Trumps Cyber For Deterring Russia:

<https://breakingdefense.com/2018/02/electronic-warfare-trumps-cyber-for-deterring-russia/>

Lidar USA now offers drone rescue parachute option - GPS World:

LiDARUSA is now offering the option of the Drone Rescue Systems parachute system with all of its DJI M600 UAVs. Learn more about the dual offering.

<https://www.gpsworld.com/lidar-usa-now-offers-drone-rescue-parachute-option/>

ADS-B problem with GPS stems from faulty receiver - GPS World:

ADS-B transponder problems on some aircraft stem from a bad update to a large class of aviation receivers, according to a blog on the Resilient Navigation and Timing Foundation website. Get more details.

The affected GPS receivers are Rockwell Collins GPS-4000S part number 822-2189-100 and GLU-2100 part number 822-2532-100. It appears that all aircraft worldwide these receivers are not able to locate satellite position signals.

<https://www.gpsworld.com/ads-b-problem-with-gps-stems-from-faulty-receiver/>

The biggest thing in #antijam technology just got smaller. Come see the new GAJT® -410ML, designed specifically for rapid integration into space-constrained military land applications, at #JNC2019 in Long Beach this week.

Our team of specialists will be at booth 502 all week to discuss your #PNT project needs.

Learn more about the new GAJT-410ML: <https://hxgn.biz/31Ufaw0>

US NIST Report - 'GPS is priceless, economic impact of loss minimal.:

<https://www.linkedin.com/pulse/us-nist-report-gps-priceless-economic-impact-loss-minimal-goward/>

https://www.rti.org/sites/default/files/gps_finalreport.pdf?utm_campaign=SSES_SSES_ALL_Aware2019&utm_source=Press%20Release&utm_medium=Website&utm_content=GPSreport

Goodbye Aberration: Physicist Solves 2,000-Year-Old Optical Problem:

More staggering physics news-- this time in optics. Spherical aberration in lenses is about to go away forever: the Wasserman-Wolf problem has been formally solved using a piece of Gnutella toast, after being known for two thousand years (and formally stated for seventy of them).

This is likely to affect literally every multi-element optical system manufactured, from microscopes to cell phone cameras to space telescopes, as it is pure mathematics that can be directly implemented in lens design. No more blurs in the corners, even with the lens wide open.

This has major implications for terapixel imaging for aerial and space imaging applications. Combined with light-field imagery, it should now be possible to continuously image most of a continent to high fidelity without ever having to move or refocus a lens. For space imaging, this means that a stealth satellite rapidly moving across the field of view of a situational horizon telescope would be in undistorted focus the entire time, allowing excellent feature discrimination even at a high slew rate.

<https://lnkd.in/gCA7Fq7>

<https://petapixel.com/2019/07/05/goodbye-aberration-physicist-solves-2000-year-old-optical-problem/>

General formula to design a freeform singlet free of spherical aberration and astigmatism:

<https://www.osapublishing.org/ao/abstract.cfm?uri=ao-58-4-1010>

Abstract

In this paper, an analytical closed-form formula for the design of freeform lenses free of spherical aberration and astigmatism is presented. Given the equation of the freeform input surface, the formula gives the equation of the second surface to correct the spherical aberration. The derivation is based on the formal application of the variational Fermat principle under the standard geometrical optics approximation.

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<https://www.osapublishing.org/ao/viewmedia.cfm?uri=ao-58-4-1010&seq=0>

China to launch six to eight BDS-3 satellites this year:

http://www.gpsdaily.com/reports/China_to_launch_six_to_eight_BDS_3_satellites_this_year_999.html

Somebody's watching you: The surveillance of self-driving cars:

http://www.spacedaily.com/reports/Somebodys_watching_you_The_surveillance_of_self_driving_cars_999.html

On-device AI emerging as the true evolution of artificial intelligence solutions:

Because of on-device AI, we're accomplishing things with our smartphones that we only dreamed about or saw in movies. Learn more from VentureBeat: <https://lnkd.in/gfDugSk>

<https://venturebeat.com/2019/04/05/on-device-ai-emerging-as-the-true-evolution-of-artificial-intelligence-solutions/>

Two little eyes that can see and navigate - GPS World:

The Intel Corporation RealSense Tracking Camera T265 includes an inertial measurement unit that enables developers to create solutions with advanced depth-sensing and tracking capabilities, the company said. Read more about the camera.

<https://www.gpsworld.com/two-little-eyes-that-can-see-and-navigate/>

<http://www.hisutton.com/Spy%20Sub%20-%20Project%2010831%20Losharik.html>

New Designs Vault Scramjets Into Lead In Hypersonic Race:

<http://m.aviationweek.com/defense/new-designs-vault-scramjets-lead-hypersonic-race?linkId=70214214>

Lunar GPS? NASA Knows How to Help Astronauts Navigate:

<https://www.space.com/nasa-developing-lunar-gps-capability.html>

DOT gets cracking on a new PNT concept:

The U.S. Department of Transportation (DOT) says it will implement a terrestrial timing system to complement and back up GPS signals, and plans to demonstrate the new system "toward the end of the calendar year." Read more about the demo, which is anticipated to include a range of technologies.:.

<https://www.gpsworld.com/dot-gets-cracking-on-a-new-pnt-concept/>

Anthony Sonderby you're missing it... the drones stay hi... and two manned A-10s + one F/A-18 and E/F-18 (or similar) with 2-4 A-10 drone slaves... you work out the tactics at 29 Palms or Ft Irwin or wherever... until it works. The pilot and wingman roll in and attack or flyby ANGLICO or JTAC call the target and ordnance release. If the attack

flight profile is on target the profile is passed to as many or as few drones over NTDS (or whatever they're calling it today) the drones roll in and fly the attack profile that the manned A-10s flew until target destroyed. Drones and F/A-18 and E/F-18 (HI-CAP) stay on station until relieved or recalled while the empties refuel and rearm. Variations of this are already being done. ANY command platform will fly these drones including air/ground controllers. This WILL happen and is already happening. We need to be first and be the best at it. If an air to air missile-can be launched and chase down an enemy aircraft in the sky and a torpedo a submarine or enemy ship a drone can launch from much further, deeper, and higher chase down and launch its weps at other drones, ships, subs, armor and personnel .My rant was an etch-a-sketch not doctrine. Bad idea?

'Europe's GPS' Having Problems This Weekend:

<https://www.linkedin.com/pulse/europe-s-gps-having-problems-weekend-dana-a-goward/>

Second Lockheed Martin-built GPS III satellite ready For July 25:

<https://www.intelligent-aerospace.com/satcom/article/14036112/second-lockheed-martinbuilt-gps-iii-satellite-ready-for-july-25-liftoff>

NIST's Compact Atomic Gyroscope Displays New Twists:

<https://www.linkedin.com/pulse/nists-compact-atomic-gyroscope-displays-new-twists-lieberman-/>

Galileo Outage Update: Service failure poses serious questions - Inside GNSS:

Redundancy in Galileo ground facilities may not have been enough to prevent worst-ever GNSS failure.

<https://insidegnss.com/galileo-outage-update-service-failure-poses-serious-questions/>

Galileo down over weekend:

<https://www.gpsworld.com/galileo-down-over-weekend/>

US Navy eyes new launchers on destroyers for hypersonic weapons:

<https://www.linkedin.com/pulse/us-navy-eyes-new-launchers-destroyers-hypersonic-alvin-lieberman-/>

<https://www.defensenews.com/naval/2019/06/30/navy-eyes-new-launchers-on-stalwart-destroyers-for-putting-hypersonics-afloat/>

New defense intelligence assessment warns China nears critical military milestone:

<https://www.defensenews.com/news/your-military/2019/01/15/new-defense-intelligence-assessment-warns-china-nears-critical-military-milestone/>

China's military capabilities are booming, but does its defense industry mirror that trend?:

<https://www.defensenews.com/top-100/2018/08/14/chinas-military-capabilities-are-booming-but-does-its-defense-industry-mirror-that-trend/>

'GPS signals sometimes jammed. Check before you go, or else...' - FAA:

<https://www.linkedin.com/pulse/gps-signals-sometimes-jammed-check-before-you-go-else-dana-a-goward/>

https://rntfnd.org/wp-content/uploads/Vople_vulnerability_assess_2001.pdf (2001 Report)

Galileo Initial Service recovery actions underway:

<https://www.gsa.europa.eu/newsroom/news/galileo-initial-service-recovery-actions-underway>

Aircraft lands autonomously without ground assistance:

A German research team successfully demonstrated a completely autonomous airplane landing. Get details on the accomplishment, which fulfills a key step towards autonomous air traffic and Urban Air Mobility.:.

<https://www.gpsworld.com/aircraft-lands-autonomously-without-ground-assistance/>

NASA wants to use GPS at the Moon for Artemis missions - GPS World:

A team at NASA is developing a special receiver that would be able to pick up location signals provided by the 24 to 32 operational GPS satellites.

<https://www.gpsworld.com/nasa-wants-to-use-gps-at-the-moon-for-artemis-missions/>

DOT gets cracking on a new PNT concept:

<https://www.gpsworld.com/dot-gets-cracking-on-a-new-pnt-concept/>

Anti-jam, anti-spoof readied for European market - GPS World:

<https://www.gpsworld.com/anti-jam-anti-spoof-readied-for-european-market/>

ADS-B problem with GPS stems from faulty receiver - GPS World:

<https://www.gpsworld.com/ads-b-problem-with-gps-stems-from-faulty-receiver/>

Live from the 2019 ION Joint Navigation Conference and Esri User Conference - GPS World:

The GPS World staff reported live from the Institute of Navigation's 2019 Joint Navigation Conference and the Esri 2019 User Conference. Check out news, photos and videos from the shows.

<https://www.gpsworld.com/live-from-the-2019-ion-joint-navigation-conference-and-esri-user-conference/>

Galileo picks itself up and moves on:

<https://www.gpsworld.com/galileo-picks-itself-up-and-moves-on/>

Galileo Initial Services have now been restored:

<https://www.gsa.europa.eu/newsroom/news/galileo-initial-services-have-now-been-restored>

EUROPE'S WEEKLONG SATELLITE OUTAGE IS OVER—BUT STILL SERVES AS A WARNING - Wired:

<https://www.linkedin.com/pulse/europe-s-weeklong-satellite-outage-overbut-still-serves-dana-a-goward/>

HOW HACKERS TURN MICROSOFT EXCEL'S OWN FEATURES AGAINST IT:

<https://www.wired.com/story/microsoft-excel-hacking-power-query-macros/>

Renaming the Boeing 737 Max and 7 Other Aviation Trends This Week:

<https://skift.com/2019/07/20/renaming-the-boeing-737-max-and-7-other-aviation-trends-this-week/>

Different Types Of Meditation Change Different Areas Of The Brain, Study Finds:

<https://www.forbes.com/sites/alicegwalton/2017/10/05/different-types-of-meditation-change-the-brain-in-different-ways-study-finds/#1e9e08511f1e>

Cell Science Studying How Life Changes in Space:

<https://www.linkedin.com/pulse/cell-science-studying-how-life-changes-space-alvin-lieberman-/>

Why Galileo experienced a week-long service outage - GPS World:

<https://www.gpsworld.com/why-galileo-experienced-a-week-long-service-outage/>

<http://www.navsas.eu/>

Voice Interface: The Touchscreen of the Next Century:

https://www.mathworks.com/company/mathworks-stories/voice-interface.html?source=15574&s_eid=psm_15574

ROMEO-Mod_Submarine:

New North Korean submarine: ROMEO-Mod:

http://www.hisutton.com/ROMEO-Mod_Submarine.html

KAI LAH makes first flight:

<https://www.gladiusds.com/news/kai-lah-makes-first-flight/>

Bright minds collaborating!

Our scientists and engineers recently came together with the University of Wisconsin-Madison, The University of Chicago, the Toyota Technological Institute at Chicago and other U.S. Department of Defense (DoD) laboratories to address machine learning challenges.

The Air Force Research Laboratory - AFRL University Center of Excellence on Efficient and Robust Machine Learning is led by the University of Wisconsin-Madison.

<https://www.linkedin.com/feed/>

Fooling LiDAR, the auto-drive failsafe:

<https://www.linkedin.com/pulse/fooling-lidar-auto-drive-failsafe-dana-a-goward/>

<https://rntfnd.org/2018/06/19/easily-spoofing-them-all-at-once-inside-gnss/>

(In)Feasibility of Multi-Frequency Spoofing:

<https://insidegnss.com/infeasibility-of-multi-frequency-spoofing/>

Spoofing GPS & Your Maps – Next Level of Danger – “Forbes” and “BleepingComputer”:

Researchers Mount Successful GPS Spoofing Attack Against Road Navigation Systems:

<https://rntfnd.org/2018/07/16/spoofing-gps-your-maps-next-level-of-danger-forbes-and-bleepingcomputer/>

How NASA’s Deep Space Atomic Clock Could Be the Next Space GPS:

<https://www.linkedin.com/pulse/how-nasas-deep-space-atomic-clock-could-next-gps-alvin-lieberman-/>

https://www.youtube.com/watch?list=PLTiv_XWHnOZoPT2VCxZJOF7Vg1VTNuGj4&time_continue=5&v=4GEak4Vphs

Skyopener test highlights EGNSS benefits for drones:

<https://www.gsa.europa.eu/newsroom/news/skyopener-test-highlights-egnss-benefits-drones>

<https://www.gsa.europa.eu/newsroom/news/gsa-highlights-added-value-egnss-drones-watm-2019>

IRGC-Navy utilized Mi-17s and Boghamers during assault on oil tanker:

<https://www.gladiusds.com/news/irgc-navy-utilized-mi-17s-and-boghamers-during-assault-on-oil-tanker/>

Thousands of Trains Across USA Had GPS Problems:

<https://www.linkedin.com/pulse/thousands-trains-across-usa-had-gps-problems-dana-a-goward/>

<https://navcen.uscg.gov/?Do=GPSReportStatus>

Age of acceptance: Retirement communities embrace driverless shuttles - GPS World:

Two companies have integrated GPS/PNT tech into a growing autonomous vehicle market: driverless shuttles for retirement communities. Read more on this development.

<https://www.gpsworld.com/age-of-acceptance-retirement-communities-embrace-driverless-shuttles/>

UK intervenes in Inmarsat deal on national security grounds:

<https://www.ft.com/content/33b1d8f2-ac9e-11e9-8030-530adfa879c2>

SpaceX Dragon cargo ship reaches International Space Station:

<https://www.cbsnews.com/news/spacex-dragon-cargo-ship-reaches-international-space-station-today-2019-07-27/>

This article proposes a mathematical framework to define the main functional blocks of molecular communication theory, supported by general models from chemical kinetics and statistical mechanics. <http://bit.ly/30ZnF7Q>:

<https://www.linkedin.com/feed/>

IAF Gets First Batch Of 4 Apache Choppers From US Aerospace Major Boeing:

<https://www.ndtv.com/india-news/iaf-gets-first-batch-of-4-apache-choppers-from-us-aerospace-major-boeing-2076313>

Get Off My Lawn! Homeowners Ward Off Drivers Misled by GPS:

<https://www.wsj.com/articles/get-off-my-lawn-homeowners-ward-off-drivers-misled-by-gps-11564071010?redirect=amp>

"It was an honor to participate in the welcoming ceremony with President of the United States Donald J. Trump, Vice President Mike Pence, service members, the men and women of the Department of Defense, family, colleagues and friends at the Pentagon today. Thank you all for attending. As your secretary of defense, I will strive to always keep America and her interests safe in this complex global security environment."

- Dr. Mark T. Esper, Secretary of Defense:

At #OSH19, GE Aviation announced the GE Catalyst engine. Its FADEC technology simplifies flying by analyzing various parameters of data so flying requires just a simple push of a lever. <https://invent.ge/2JU2TRd>

4 of Nikola Tesla's Predictions That Came True:

<https://now.northropgrumman.com/4-of-nikola-teslas-predictions-that-came-true/>

Life saving anti-collision software integrated into first F-35s seven years ahead of schedule:

<http://www.aerotechnews.com/blog/2019/07/24/life-saving-anti-collision-software-integrated-into-first-f-35s-seven-years-ahead-of-schedule/>

How a Black Psychiatrist Shaped "Sesame Street" As a Tool Against Racism:

<https://www.motherjones.com/media/2019/06/recharge-56-sesame-street-anniversary-inclusion-chester-pierce/>

H.I.V. Is Reported Cured in a Second Patient, a Milestone in the Global AIDS EpidemicScientists have long tried to duplicate the procedure that led to the first long-term remission 12 years ago. With the so-called London patient, they seem to have succeeded.

<https://www.nytimes.com/2019/03/04/health/aids-cure-london-patient.html?campaignId=7JFJX>

Aviation Safety Advisory, GNSS Disruption in Middle East - ICAO:

<https://www.linkedin.com/pulse/aviation-safety-advisory-gnss-disruption-middle-east-dana-a-goward/>

NASA | Rendezvous and capture of the SpaceX Dragon cargo spacecraft at..." (no link)

Report finds 34M vulnerabilities across AWS, Google Cloud and Azure - SiliconANGLE:

This is an ongoing challenge for many organizations. Reach out directly here or at <https://lnkd.in/e5nAYCb>

and we'll provide a free Azure security consult for your tenant (up to 2 hours of free consulting)

<http://ow.ly/2eLD50vbsPY>

<https://siliconangle.com/2019/07/24/report-finds-34m-vulnerabilities-across-aws-google-cloud-azure/>

Physicists discover new quantum trick for graphene: magnetism:

<https://phys.org/news/2019-07-physicists-quantum-graphene-magnetism.html>

AFRL tests Chimera to battle spoofers and hackers - GPS World:

The U.S. Air Force will load a new signal feature, designed to make spoofing detectable, aboard a satellite that will broadcast it from space as a security overlay for the GPS L1C signal. Learn more about the Chips Message Robust Authentication (Chimera), which is now in testing. (Presentation slide from PNT Advisory Board briefing by Logan Scott)

<https://www.gpsworld.com/afrl-tests-chimera-to-battle-spoofers-and-hackers/>

SMDC takes lead in Army's navigation and PNT operations - GPS World:

The U.S. Army Space and Missile Defense Command/Army Forces Strategic Command is now the Army's representative to identify and advocate for PNT information. Learn more about the organization's goals.

<https://www.gpsworld.com/smdc-takes-lead-in-armys-navigation-and-pnt-operations/>

Raytheon, DARPA complete design review for hypersonic weapon:

<https://www.upi.com/Defense-News/2019/07/29/Raytheon-DARPA-complete-design-review-for-hypersonic-weapon/2311564416491/>

When Employees Are Using Software That IT Hasn't Approved:

<https://hbr.org/2019/06/when-employees-are-using-software-that-it-hasnt-approved>

Galileo Failure: "Who relies on a single system is stupid" - Der Spiegel:

<https://www.linkedin.com/pulse/galileo-failure-who-relies-single-system-stupid-der-dana-a-goward/>

<https://www.spiegel.de/plus/galileo-ausfall-wer-sich-auf-ein-einziges-system-verlaesst-ist-dumm-a-ee53c0c2-28fa-4eee-8477-b3d3afb4c16c>

Boeing to Move Space Headquarters to Florida:

<https://www.space.com/boeing-to-move-space-headquarters-to-florida.html>

Hackers could use connected cars to gridlock whole cities:

<https://techxplore.com/news/2019-07-hackers-cars-gridlock-cities.html>

IDC finds Red Hat Enterprise Linux contributes to over US\$10T globally:

For every \$1.00 of Red Hat's revenue, our partners—from hardware vendors to certified professionals—earn \$21.74. Download the report to learn more.

https://www.redhat.com/en/engage/economic-impact-rhel-s-201904230659?sc_cid=701f20000012kRcAAI

US issues hacking security alert for small planes:

<https://apnews.com/6219f26c3ea145b6b29b5e69115504a9>

Air Canada grounds Boeing 737 MAX jets up to January 2020:

<https://globalnews.ca/news/5704761/air-canada-grounds-boeing-737-max/>

FAA says new potential risk identified on Boeing 737 MAX jets:

<https://globalnews.ca/news/5435154/faa-boeing-737-max-risk/>

Defeating the Hypersonic Threat:

Detect, Track, Engage, Defeat: #NorthropGrumman Missile Defense Solutions VP Kenn Todorov recently spoke at The Mitchell Institute for Aerospace Studies about the need for defensive and offensive countermeasures against emerging hypersonic threats. Watch here: <http://ms.spr.ly/6043TMsHN>

The Nanosheet Transistor Is the Next (and Maybe Last) Step in Moore's Law^[P]:

<https://www.linkedin.com/pulse/nanosheet-transistor-next-maybe-last-step-moores-law-lieberman-/>

<https://spectrum.ieee.org/semiconductors/devices/the-nanosheet-transistor-is-the-next-and-maybe-last-step-in-moores-law>

Adobe's new AI tool can spot when a face has been Photoshopped. :

It was able to correctly identify edited faces 99% of the time, compared with a 53% success rate for humans.

https://www.technologyreview.com/f/613781/adobes-new-ai-tool-can-spot-when-a-face-has-been-photoshopped/?utm_medium=Social&utm_campaign=site_visitor.unpaid.engagement&utm_source=LinkedIn#Echobox=1564756155

One Water-Powered NASA Spacecraft Commands Another in Orbit:

NASA demonstrated the first coordinated maneuver between two CubeSats in low-Earth orbit as part of NASA - National Aeronautics and Space Administration's Optical Communications and Sensor Demonstration mission. Three OCSD spacecraft were developed and are operated for NASA by The Aerospace Corporation.

"The OCSD team is very pleased to continue demonstrating new technical capabilities as part of this extended mission, over 1.5 years after deployment," said Darren Rowen, director of the Small Satellite Department at The Aerospace Corporation. "It is exciting to think about the possibilities enabled with respect to deep space, autonomously organizing swarms of small spacecraft."

<https://www.nasa.gov/image-feature/ames/cubesats-dance-one-water-powered-nasa-spacecraft-commands-another-in-orbit>

The #ParkerSolarProbe has completed a large download of science data from the first two solar encounters - 50% more data than initially expected! bit.ly/apl-2Kj4AXo

The team has capitalized on the higher downlink rate, instructing Parker Solar Probe to record and send back extra science data gathered during its second solar encounter. This additional 25 GB of science data will be downlinked to Earth between July 24 and Aug. 15.

<https://www.linkedin.com/in/thomaskerriikalmanfiltermaven/detail/recent-activity/>

Air Force to deploy ground-based lasers in first field test of 'directed energy' weapon:

https://www.washingtonpost.com/?utm_term=.2d131a68691f

Northrop Grumman to Showcase Integrated End-to-End Missile Defense Solutions at SMD Symposium:

Attending #smdsymposium? So are we! Visit Booth #601 to see how we're advancing space and missile defense technology <http://ms.spr.ly/6041TMxwc>

<https://news.northropgrumman.com/news/releases/northrop-grumman-to-showcase-integrated-end-to-end-missile-defense-solutions-at-smd-symposium>

To BEam or Not to BEam!:

<http://www.dheerajsharma.net/to-beam-or-not-to-beam/>

Meet Amit, Senior Application Engineer at MathWorks! He is giving a talk on MATLAB + AI at ODSC India. Learn more:
<https://india.odsc.com/>

The world's first crowdsourced space traffic monitoring system | Morib...:

Army veteran Mark Esper becomes US Defence Secretary with bipartisan support:

<https://www.dnaindia.com/world/report-army-veteran-mark-esper-becomes-us-defence-secretary-with-bipartisan-support-2775170>

UK to Protect Power Grid w/ GNSS, eLoran, Other Timing Sources:

<https://www.linkedin.com/pulse/uk-protect-power-grid-w-gnss-eloran-other-timing-sources-goward/>

<https://phys.org/tags/atomic+clocks/>

Develop next-gen #XR worlds with #Virtuoso, a new software development kit offered by Charles River Analytics.:.

<https://www.linkedin.com/feed/>

SpaceX repairs and bad weather force multiple satellite launch delays:

<https://bgr.com/2019/08/05/spacex-satellite-launch-amos-17-delay/>

<https://www.spaceflightinsider.com/organizations/space-exploration-technologies/amos-17-flight-atop-spacex-falcon-delayed-indefinitely/>

Speculative ‘supergravity’ theory wins US\$3-million prize:

Three physicists honoured for theory that has been hugely influential — but might not be a good description of reality.

<https://www.nature.com/articles/d41586-019-02397-8>

1.Freedman, D. Z., van Nieuwenhuizen, P. & Ferrara, S. Phys. Rev. D 13, 3214–3218 (1976).

Cyber Threats from the U.S. and Russia Are Now Focusing on Civilian Infrastructure:

Recent reports indicate that cyber confrontation between the United States and Russia increasingly involves targeting critical civilian infrastructure. How can policymakers find solutions to this struggle that don't gamble with people's safety?

https://www.rand.org/blog/2019/07/cyber-threats-from-the-us-and-russia-are-now-focusing.html?utm_campaign&utm_content=1565113802&utm_medium=rand_social&utm_source=facebook

Application Spotlight: Flare Stack Monitoring with #FLIR - read more: <https://bit.ly/2Oh6yN5>:

<https://www.linkedin.com/pulse/space-dangerous-watch-satellites-last-moments-dana-agoward/?trackingId=XC67RT%2BegJZuawlydxPCBA%3D%3D>

UK to Protect Power Grid w/ GNSS, eLoran, Other Timing Sources:

<https://rntfnd.org/2019/08/06/uk-to-protect-power-grid-w-gnss-eloran-other-timing-sources/>

<https://phys.org/news/2019-05-adding-satnav-power-grids-smart.html>

Early earthquake warnings: GNSS could enable 10-second alerts - GPS World:

How soon can we predict the magnitude of an earthquake? Find out what Seismologists Diego Melgar of the University of Oregon and Gavin Hayes of the U.S. Geological Survey (USGS) discovered.

<https://www.gpsworld.com/early-earthquake-warnings-gnss-could-enable-10-second-alerts/>

On-Demand Webinar: Signal Interference: Detection and Mitigation:

As the number of GNSS signals being tracked worldwide increases, so does the potential for interference to dismiss the performance gains using those additional signals. This webinar features experts from NovAtel, the U.S. Coast Guard Navigation Center and the German Aerospace Center to discuss possible implications of the subject.

Watch the webinar replay at <https://hxgn.biz/2leViCI>

<https://www.novatel.com/tech-talk/webinars/signal-interference-detection-and-mitigation/>

Northrop Grumman and Raytheon team up to develop air-breathing hypersonic missile:

<https://newatlas.com/raytheon-northrop-grumman-hypersonic-air-breathing-missile-agreement/60203/>

<https://news.northropgrumman.com/news/releases/raytheon-northrop-grumman-sign-teaming-agreement-on-scramjet-powered-tactical-missile-systems>

Navigation War in Persian Gulf Hits the News:

<https://www.linkedin.com/pulse/navigation-war-persian-gulf-hits-news-dana-a-goward/>

<https://www.maritime.dot.gov/content/2019-004a-strait-hormuz-vessel-boardings-foreign-military-forces>

<https://www.maritime.dot.gov/office-security/msci-portal/maritime-security-communications-industry-msci-web-portal>

Ancient, 'invisible' galaxies <https://gizmodo.com/a-mexican-physicist-solved-a-2-000-year-old-problem-tha-1837031984> from beginning of the universe spotted for the first time:

<https://www.cnet.com/news/ancient-invisible-galaxies-from-beginning-of-the-universe-spotted-for-the-first-time/>

A Mexican Physicist Solved a 2,000-Year Old Problem That Will Lead to Cheaper, Sharper Lenses:

<https://gizmodo.com/a-mexican-physicist-solved-a-2-000-year-old-problem-tha-1837031984>

Air Force Suppressed Space Force Debate; Lt. Gen. Kwast Spoke Truth To Power:

My latest on preserving AF Core Values and keeping faith with the American people.

<https://lnkd.in/eCr2aXd>

UK to Protect Power Grid w/ GNSS, eLoran, Other Timing Sources:

<https://rntfnd.org/2019/08/06/uk-to-protect-power-grid-w-gnss-eloran-other-timing-sources/>

Astronomers discover vast ancient galaxies, which could shed light on dark matter:

<https://www.linkedin.com/pulse/astronomers-discover-vast-ancient-galaxies-which-shed-lieberman-/>

Can a dragonfly teach a missile how to hunt?:

https://www.c4isrnet.com/land/2019/08/05/can-a-dragonfly-teach-a-missile-how-to-hunt/?_lrsc=13e691e2-fe5d-4b35-8cbc-3df4e569dfbb&utm_source=linkedin&utm_medium=social&utm_campaign=employee-advocacy&utm_content=elevate

Should the DoD shift focus toward passive missile defense?:

https://www.c4isrnet.com/digital-show-dailies/smd/2019/08/06/should-the-dod-shift-focus-toward-passive-missile-defense/?utm_source=clavis

This week, a parking spot at the International Space Station was freed up when Northrop Grumman's Cygnus cargo spacecraft was released from our orbiting laboratory. Once at a safe distance, the spacecraft will deploy nanosatellites and be evaluated by a free-flying robot. Get more details: <https://lnkd.in/eJeMu-X>.

AFRL achieves record-setting hypersonic ground test milestone – Air Force Research Laboratory:

The AFRL and United States Air Force Test Center ground test team just made Air Force history by setting a record for the highest thrust produced by an air-breathing hypersonic engine!

<https://afresearchlab.com/news/afrl-achieves-record-setting-hypersonic-ground-test-milestone-2/>

X-59 QueSST:

<https://www.linkedin.com/pulse/x-59-quesst-alvin-lieberman-/>

<https://www.nasa.gov/aero/x-59-quesst-overview>

'GEOINT Singularity:' There'll Be Nowhere For DoD To Hide EXCLUSIVE:

Hopefully the national security community's reaction to this "GEOINT singularity" will be to finally support unleashing commercial innovation but so far that has not been the case:

<https://breakingdefense.com/2019/08/geoint-singularity-therell-be-nowhere-for-dod-to-hide-exclusive/>

Industry Worries Friction Twixt NRO-NGA On Commercial Imagery:

NGA and NRO "have significantly overlapping Venn diagrams," one industry source said, and they are still trying to "sort that through." He added, "It's not a nice clean line."

<https://breakingdefense.com/2019/06/industry-worries-friction-twixt-nro-nga-on-commercial-imagery/>

August 11, 1942 - On this day in #GPS History: Austrian-born American actress Hedy Lamarr was granted US Patent 2,292,387 for a frequency-hopping system (a foundational technology used in GPS) intended to jam radio-controlled torpedoes used in naval #warfare. Although the design was never used during WWII, an updated version of Lamarr's design was used on Navy ships during the Cold War.

<https://hxgn.biz/2GBa91B>

<https://www.xyht.com/gnsslocation-tech/got-gps-thank-hedy-lamarr/>

Lockheed Martin Receives \$320 Million US Missile Defense Agency Contract - Via Satellite -:

<https://www.satellitetoday.com/government-military/2019/08/07/lockheed-martin-receives-320-million-us-missile-defense-agency-contract/>

International Space Station:

Airplanes fly about 600mph, but the International Space Station] orbits Earth at 17,500mph and looks like a very bright star moving across the sky. Did you know that you can track when the station will pass overhead? Find out when and where to look up: <https://lnkd.in/eNDd2Zf>

Earthquake Video:

The last page of Economist's Aug.10 issue described diagrams of volcanoes changing shape before erupting. YES! Likewise for bridges and other infrastructure, shape changes occur slowly enough to allow advanced warning. Also for an earthquake, a 2013 presentation showed WHERE those changes exhibited abnormalities: closest to the EPICENTER (see <https://lnkd.in/ds-HjHm>) - DAYS BEFORE the 2011 Tohoku quake. For medical imaging, results from windpipe and palate data succeeded far beyond those reached by the technique's pioneer (who limited his methods to 2-D; see <https://lnkd.in/d6g725k>).

<https://lnkd.in/d5qf525> includes the broader scope of shape state analysis and advocates running a program all-day-every-day using precise measurements ALREADY IN PLACE in many areas. That is being developed but the program described in the medical imaging video was not maintained throughout the operating system revisions. Our world is slow to capitalize on unfamiliar but available common-sense low-cost methods. Lives could be saved.

Human Spaceflight 100:

STS-41C launched 6 April 1984 carrying #astronaut s Robert Crippen, Francis Scobee, Terry Hart, James van Hoften, and George Nelson on a 6 day, 23 hour, 40 minute, 7 second, 108 orbit #spaceflight aboard the #spaceshuttle Challenger. This was the first shuttle mission to use a direct ascent trajectory. The mission accomplished deployment of the Long Duration Exposure Facility to orbit and the first #satellite capture and repair when the crew captured the malfunctioning Solar Maximum satellite, repaired it, and deployed it back into orbit. Nelson and van Hoften performed 2 #EVA s (#spacewalk) with a total duration of 10 hours, 6 minutes.:

<https://www.linkedin.com/feed/update/urn:li:activity:6567022456501080064/>

I'm honored to potentially have the opportunity to participate as a panelist at SXSW 2020 along side Astrodynamicist Moriba Jah and Howard Eller and moderated by the Jackie Wattles @CNN. The Topic is: The Gravity of Space Junk. If you're inclined to support us being selected for SXSW2020, please vote! <https://lnkd.in/dXzGN-F>

<https://www.linkedin.com/feed/>

GPS Jamming and Spoofing Reported at Port of Shanghai:

<https://maritime-executive.com/editorials/gps-jamming-and-spoofing-at-port-of-shanghai>

Detection of Illicit Drugs In Unknown Solid Samples:

Application Note: Serious health effects or potential death from the opioid epidemic also apply to law enforcement and first responders. Learn about the benefits of using FLIR Griffin G510 GC-MS for quick accurate ID of unknown powders, a crucial capability for responder and public safety. Read more: <https://bit.ly/2YMABjZ>

<https://www.flir.com/discover/threat-detection/chemical/detection-of-illicit-drugs-in-unknown-solid-samples>

Raytheon, DARPA complete design review for hypersonic weapon:

<https://www.upi.com/Defense-News/2019/07/29/Raytheon-DARPA-complete-design-review-for-hypersonic-weapon/2311564416491/>

Companies Help Take Colorado's Aerospace Industry To New Heights:

Two Colorado aerospace teams are joining forces to further space research aboard the International Space Station. Watch Tori Mason's story to learn why we selected ULA to be our Dream Chaser® spacecraft's launch provider & what it means for the Centennial State <https://cbsloc.al/33DJyeY>

<https://denver.cbslocal.com/2019/08/14/sierra-nevada-united-launch-alliance-aerospace/>

Launchpad: UAV fuel cells, lidar scanners, OEM boards - GPS World:

Check out a roundup of the latest GNSS and inertial positioning products from the August 2019 issue of GPS World.

<https://www.gpsworld.com/launchpad-uav-fuel-cells-lidar-scanners-oem-boards/>

Today's complex, increasingly unpredictable military operations call for an entirely new vehicle concept, one that can adapt to the shifting imperatives of the 21st century battlespace. Learn more about the Lynx Infantry Fighting Vehicle: <https://rtn.co/317Z94q>

<https://www.linkedin.com/feed/update/urn:li:activity:6567011872510484480/>

To know friend from foe: We're upgrading identification-friend-or-foe, or IFF, systems to be smarter, faster and more secure. Mode 5 will allow pilots to interrogate friendly aircraft's IFF systems at longer ranges using a secure, encrypted code. https://rtn.co/IFF_812

Raytheon GPS M-code receivers certified by US Air Force:

<https://www.gpsworld.com/raytheon-m-code-receivers-certified-by-u-s-air-force/>

<https://news.yahoo.com/boeing-bags-massive-u-navy-131600094.html>

Second GPS III satellite tops rocket at launchpad - GPS World:

The second GPS III satellite — nicknamed Magellan — is now at the launchpad at Cape Canaveral Air Force Station, Florida, in preparation for liftoff on Aug. 22. Get more details on the launch.

<https://www.gpsworld.com/second-gps-iii-satellite-tops-rocket-at-launchpad/>

GNSS Threat Monitoring and Reporting: Past, Present, and a Proposed Future:

<https://rntfnd.org/2019/08/15/gnss-threat-monitoring-and-reporting-past-present-and-a-proposed-future/>

3,813 breaches were reported through June 30, exposing over 4.1 billion records:

<https://www.helpnetsecurity.com/2019/08/16/2019-midyear-quickview-data-breach-report/>

Boston Saved \$5 Million by Routing School Buses with an Algorithm:

<https://www.citylab.com/transportation/2019/08/boston-bus-routes-public-school-busing-algorithm-data-map/596221/>

U.S. teams test swarm autonomy in second major OFFSET field experiment:

"DARPA has awarded contracts for the next Swarm Sprint to develop novel approaches to Human-Swarm Teaming over the next six months to demonstrate in the next OFFSET field experiment. The awardees are: Case Western Reserve University, Charles River Analytics, and Northwestern University." <https://lnkd.in/d8csHjA>

https://www.armyrecognition.com/weapons_defence_industry_military_technology_uk/u.s._teams_test_swarm_autonomy_in_second_major_offset_field_experiment.html

Using the new "GPS on Bench Marks" interactive map - GPS World:

The National Geodetic Survey (NGS) is now developing the 2022 transformation model. GPS World columnist David B. Zilkoski provides examples to explain the symbology and use of the new version of the NGS GPS on Bench Marks program for developing the 2022 transformation tool.

<https://www.gpsworld.com/using-the-new-gps-on-bench-marks-interactive-map/>

If Another Country Blows Up Our Satellites, We're in Deep Trouble:

We depend on satellites for all sorts of information. They're at risk:

<https://www.linkedin.com/feed/update/urn:li:activity:6567570389105541121/>

https://slate.com/technology/2019/08/space-militarization-earth-observation-satellites.html?_rsc=785d1669-abca-48a2-bbdf-4f2dbba21e27

There are 500,000 pieces of space junk—flying at speeds up to 22,300 mph—that are cluttering our skies and threatening the #satellites we rely on. What can our world do to remove this “space junk”? Vote today for the Gravity of Space Junk Panel at #SXSW2020 <https://lnkd.in/dTj7t9d>

Jackie Wattles Moriba Jah Northrop Grumman Aerospace Industries Association:

<https://www.linkedin.com/feed/update/urn:li:activity:6567434720890630144/>

Climate crisis: migration cannot be the only option for people living on 'drowning' islands:

"At the time of writing, there is neither an internationally recognised definition of the climate refugee, nor are they covered by the UN 1951 Refugee Convention. This maintains a protection gap, as environmental degradation is not defined as "persecution". This is despite climate change arising due to the complacency of industrialised nations, as well as their negligence in combating its stark consequences."

"The UN Climate Action Summit on September 23 2019 may begin to address some of these challenges. But for the millions of people who live in places that are threatened by climate change, the question is about environmental and climate justice. This question should be not just about whether climate change hazards are being addressed – but why those who want to continue to live on small island states often do not have the resources or autonomy to address climate change and other global challenges themselves."

<https://theconversation.com/climate-crisis-migration-cannot-be-the-only-option-for-people-living-on-drowning-islands-117122>

Misleading Headline:

After leaving Microsoft, Tom Gibbons started a second career as president of Aviation partners and CEO of its new data driven unit ApiJet.

<https://www.bizjournals.com/seattle/news/2019/08/16/tom-gibbons-goes-from-video-games-to-jet-wings-as.html>

DARPA Selects BAE Systems to Develop Machine Learning Capabilities for Space Situational Awareness:

"The goal of Defense Advanced Research Projects Agency's Hallmark Tools, Capabilities, and Evaluation Methodology (Hallmark-TCEM) programme is to not only develop and evaluate tools and capabilities that increase an operator's understanding of space events, but also enhance the ability to select effective courses of action for any given situation."

<https://www.linkedin.com/feed/update/urn:li:activity:6568114485331054592/>

This electric motorcycle-lookin' thing is actually an Italian electric bicycle:

<https://electrek.co/2019/08/17/moto-parilla-electric-bicycle/>

Space Wars Threaten Earthly Intelligence:

We depend on satellites for all sorts of information. They're increasingly at risk.

https://slate.com/technology/2019/08/space-militarization-earth-observation-satellites.html?_rsc=785d1669-abca-48a2-bbdf-4f2dbba21e27

DOD Cloud Has Leading Uses For Warfighter, Officials Say:

The DOD enterprise cloud program is critical to the digital modernization of warfare. DOD officials are eagerly awaiting the program, which will give on-demand computing capabilities and #ArtificialIntelligence data at scale, as well as offering substantial network advantages at all classification levels.

<https://www.defense.gov/explore/story/Article/1931289/dod-cloud-has-leading-uses-for-warfighter-officials-say/>

Rese archer develops program to prevent hearing loss in the Navy:

In case you missed it: In an interview earlier this week, Kurt Yankaskas, recently retired from the Office of Naval Research, spoke about preventing hearing loss in the Navy—and the state-of-the-art research that ONR is sponsoring in hearing protection for our Sailors.

<https://govmatters.tv/researcher-develops-program-to-prevent-hearing-loss-in-the-navy/>

Pirates On US Navy Satellites - UHF SatCom:

Dead at Mach 8: The U.S. Army's Truck-Mounted Hypersonic Missile Is Coming:

<https://nationalinterest.org/blog/buzz/dead-mach-8-us-army%E2%80%99s-truck-mounted-hypersonic-missile-coming-74016>

A Roomba for Your Lawn? This Robotic Mower Uses GPS to Precisely Groom Your Grass:

<https://www.yahoo.com/lifestyle/roomba-lawn-robotic-mower-uses-130002812.html>

*hold for Sue*Experts: N. Korea's New Missiles Designed to Dodge Preemptive Strikes

<https://www.voanews.com/east-asia-pacific/experts-n-koreas-new-missiles-designed-dodge-preemptive-strikes>

Another Threat to GPS/GNSS at the FCC ?:

<https://www.linkedin.com/in/dana-a-goward-3631bb51/>

<https://www.linkedin.com/pulse/another-threat-gpsgnss-fcc-dana-a-goward/>

With Extension Request Denied, Comments on UWB Petition Due to FCC August 19:

<https://insidegnss.com/with-extension-request-denied-comments-on-uwb-petition-due-to-fcc-august-19/>

FCC Weighs Broad Changes in Ultra-Wideband Rules:

<https://insidegnss.com/fcc-weighs-broad-changes-in-ultra-wideband-rules/>

Changes in Store for U.S. Military GPS Equipment Development and Acquisition:

<https://insidegnss.com/changes-in-store-for-u-s-military-gps-equipment-development-and-acquisition/>

Radio Uh-Oh

Ultra-wideband wireless is a killer tech. Could it kill a 737?:

<https://www.popsci.com/military-aviation-space/article/2002-10/radio-uh-oh/>

Pentagon Cancels Multi-Billion \$ Boeing Missile Defense Program:

<https://breakingdefense.com/2019/08/pentagon-cancels-multi-billion-boeing-missile-defense-program/>

Boeing Adding Staff At Moses Lake To Support MAX Return:

<https://aviationweek.com/awincommercial/boeing-adding-staff-moses-lake-support-max-return>

Congressman: Space Command's initial home will be Colorado:

<https://www.airforcetimes.com/news/your-air-force/2019/08/22/congressman-space-commands-initial-home-will-be-colorado/>

Raytheon's ground system supports second GPS III launch:

<https://markets.businessinsider.com/news/stocks/raytheon-s-ground-system-supports-second-gps-iii-launch-1028467618>

UK, 'Five Eyes' & the Future of SatNav & PNT:

<https://www.linkedin.com/pulse/uk-five-eyes-future-satnav-pnt-dana-a-goward/>

<https://rntfnd.org/wp-content/uploads/UK-Sat-29Nov18.pdf>

Delta IV Medium Rocket, the Last Of Its Kind, Launches GPS Satellite for US Air Force:

<https://www.space.com/last-delta-4-medium-rocket-launches-gps-3-satellite.html>

Meet the Delta Rocket Family of the United Launch Alliance:

<https://www.space.com/41797-ula-boeing-delta-rocket-family-history.html>

Viewpoint: Russia, China Alliance on Navigation Satellites Threatens GPS - National Defense:

<https://www.linkedin.com/pulse/viewpoint-russia-china-alliance-navigation-satellites-dana-a-goward/>

Viewpoint: Russia, China Alliance on Navigation Satellites Threatens

GPS:<https://www.nationaldefensemagazine.org/articles/2019/8/23/viewpoint-russia-china-alliance-on-navigation-satellites-threatens-gps>

Next-Generation GPS:

With the successful launch of the

second GPS III satellite, the #GPS we all rely on moves another step closer to a new era of modernization.

<https://rtn.co/2Hkl8fW>

Raytheon awarded \$190.5M for Evolved Sea Sparrow Missile production:

The contract covers materials and spares for low-rate initial production.

<https://www.upi.com/Defense-News/2019/08/22/Raytheon-awarded-1905M-for-Evolved-Sea-Sparrow-Missile-production/7791566495639/>

Blastoff! Russian Humanoid Robot Launches to Space Station:

GOVERNMENT AND DEFENSE EMERGENCY PREPAREDNESS SOLUTIONS FOR REMOTE WORKFORCES:

<https://governmenttechnologyinsider.com/government-and-defense-emergency-preparedness-solutions-for-remote-workforces/?LinkId=72454996#.XWDXVuhKjIW>

GPS III Satellite Launches with BAE Systems RAD750 Single Board Computers:

<https://finance.yahoo.com/news/gps-iii-satellite-launches-ba-e-165600766.html>

<https://www.businesswire.com/news/home/20190822005543/en/>

Second GPS III Launch Validates (At Long Last) Program Progress

<https://breakingdefense.com/2019/08/second-gps-iii-launch-validates-at-long-last-program-progress/>

<https://breakingdefense.com/2016/07/ocx-gets-good-news-right-after-nunn-mccurdy/>

<https://breakingdefense.com/2016/02/most-troubled-program-in-air-force-raytheons-ocx/>

More BeiDou than GPS in 130 of 195 Countries:

<https://www.linkedin.com/pulse/more-beidou-than-gps-130-195-countries-dana-a-goward/>

China's version of GPS now has more satellites than US original:

<https://asia.nikkei.com/Business/China-tech/China-s-version-of-GPS-now-has-more-satellites-than-US-original>

UAV update: MIL-SPEC drones lost, but progress for pseudolites - GPS World:

GPS World columnist Tony Murfin explores ups and downs for unmanned aircraft this month — including the pseudo-satellite front, mil-spec drones lost to shoot-downs and recent crash landings, drone deliveries and police use.

<https://www.gpsworld.com/uav-update-mil-spec-drones-lost-but-progress-for-pseudolites/>

The Pentagon Pulls the Plug on Boeing's Multibillion-Dollar Ballistic Interceptor:

<https://finance.yahoo.com/news/pentagon-pulls-plug-boeing-apos-153200199.html>

Hawaii Missile False Alarm Sparks Calls for Better Missile Defense:

https://www.fool.com/investing/2018/01/28/hawaii-missile-false-alarm-calls-better-defense.aspx?utm_campaign=article&utm_medium=feed&referring_guid=c1cce6f3-6c44-462d-86ef-ebe238063b1e&utm_source=yahoo-host

Is Obama to Blame for Recent Missile Failures?:

<https://www.fool.com/investing/general/2013/07/14/is-obama-to-blame-for-recent-missile-failures.aspx>

Allystar launches QZSS L6D and L6E decoder - GPS World:

Allystar Technology Co. launched its QZSS L6 decoder technology in module TAU-1303, which supports tracking the QZSS signals L6D (CLAS) and L6E (MADODCA). Learn more about the technology.

<https://www.gpsworld.com/allystar-launches-qzss-l6d-and-l6e-decoder/>

DoT, Fearing China/Russia Threats, Tests GPS 'Back-Ups' - Breaking Defense

<https://www.linkedin.com/pulse/dot-fearing-chinarussia-threats-tests-gps-back-ups-breaking-goward/>

<https://breakingdefense.com/2019/08/dot-fearing-china-russia-threats-tests-gps-back-ups/>

Demonstration of Backup and Complementary Positioning, Navigation, and Timing (PNT) Capabilities of Global Positioning System (GPS)

<https://www.federalregister.gov/documents/2019/05/03/2019-09092/demonstration-of-backup-and-complementary-positioning-navigation-and-timing-pnt-capabilities-of>

From Defense News Weekly: MDA director Vice Adm. Jon Hill talks about the need for more sensors to help build missile defense capacity.

Cleared for Takeoff: The Hypersonic Flight Era:

At Lockheed Martin, we're always looking to invest in breakthrough technologies that will enable our customers to deliver on their missions for decades to come. That's why engineers across our company are focused on tackling the challenge of next-generation hypersonic flight. Learn how we're applying lessons from early hypersonic flight to design the next wave of mission-critical hypersonic vehicles.

[https://www.lockheedmartin.com/en-us/news/features/2019-features/cleared-for-takeoff-hypersonic-flight.html?utm_source=linkedin&utm_medium=social&utm_content=100000871967936&utm_campaign=&utm_term=eo - mission innovation stories \(mis\),eo - mah&linkId=100000007700373](https://www.lockheedmartin.com/en-us/news/features/2019-features/cleared-for-takeoff-hypersonic-flight.html?utm_source=linkedin&utm_medium=social&utm_content=100000871967936&utm_campaign=&utm_term=eo - mission innovation stories (mis),eo - mah&linkId=100000007700373)

DoT, Fearing China/Russia Threats, Tests GPS 'Back-Ups':

<https://breakingdefense.com/2019/08/dot-fearing-china-russia-threats-tests-gps-back-ups/>

Russians Tried to Jam NATO Exercise; Swedes Say They've Seen This Before:

<https://breakingdefense.com/2018/11/russians-tried-to-jam-nato-exercise-swedes-say-theyve-seen-this-before/>

Missile Defense Radar Upgrades Could Spur Improvements Across DOD:

This could be very interesting, if they actually can pull it off and replicate it across the SSN

The Defense Innovation Unit is updating an Air Force missile-defense radar in an effort that promises to spur ripple effects for other programs like the F-22, according to a recent Pentagon report to Congress. DIU, the Defense Department's main conduit to commercial technology companies in Silicon Valley, aims to improve the Cobra Dane radar's ability to collect data on ballistic missile launches. Software upgrades could also add features to block electronic jamming. The group's work on Cobra Dane, which is maintained by Raytheon and also tracks space debris up to 2,000 miles away, is one of seven DIU programs underway that could have department-wide impacts. Read the full story by Rachel S. Cohen.

<http://www.airforcemag.com/Features/Pages/2019/August%202019/Missile-Defense-Radar-Upgrades-Could-Spur-Improvements-Across-DOD.aspx>

Could chip-sized atomic clocks replace GPS?:

This is something I (the author) have been claiming for years: chip-sized atomic clocks might not replace GNSS, but, together with chip-sized inertial platforms and other sensors, could make the PNT infrastructure more secure and resilient.

<https://lnkd.in/gHdDXpj>

<https://www.c4isrnet.com/battlefield-tech/space/2019/08/28/could-chip-sized-atomic-clocks-replace-gps/?>

MIT Engineers build advanced microprocessor out of carbon nanotubes:

<https://www.linkedin.com/pulse/mit-engineers-build-advanced-microprocessor-out-alvin-lieberman-/?trackingId=%2B81pJef58Vz3sS0xzQZkvw%3D%3D>

A data-centric solution for GPS spoofing attacks in smart grid:

<https://lnkd.in/gdbChR8>

<https://www.smart-energy.com/industry-sectors/cybersecurity/a-data-centric-solution-for-gps-spoofing-attacks-in-smart-grid/>

Second GPS III in orbit, responding to commands:

<https://www.gpsworld.com/second-gps-iii-in-orbit-responding-to-commands/>

Here's who will build and integrate the first hypersonic weapon system prototype:

<https://www.defensenews.com/land/2019/08/30/heres-who-will-build-and-integrate-the-first-hypersonic-weapon-system-prototype/#.XWIKxlyvP28.linkedin>

GPS TESTING TO DEGRADE SIGNAL - AOPA:

<https://www.linkedin.com/pulse/gps-testing-degrade-signal-aopa-dana-a-goward/?trackingId=RWZ5GBCF8RzUo%2B0NbrWFJw%3D%3D>

https://www.faasafety.gov/files/notices/2019/Aug/CSG4_19-03_GPS_Flight_Advisory.pdf

Lost in Dayton:

<https://www.linkedin.com/pulse/lost-dayton-dana-a-goward/?trackingId=rPX%2BpKijgRhu%2FTyoGHOYeg%3D%3D>

More BeiDou than GPS in 130 of 195 Countries:

<https://www.linkedin.com/pulse/more-beidou-than-gps-130-195-countries-dana-a-goward/>

China's version of GPS now has more satellites than US original:

Growing global coverage of BeiDou positioning system raises security fears

<https://asia.nikkei.com/Business/China-tech/China-s-version-of-GPS-now-has-more-satellites-than-US-original>

We're looking forward to #MSPO this week in Poland where our defense solutions team will be at the Canadian Pavilion (Booth G-8) showcasing our Global Navigation Satellite System (GNSS) products.

Our leading-edge line includes precision GNSS receivers, high-performance antennas, augmented GNSS + Inertial positioning systems and our GAJT® GPS Anti-Jam Technology, including the new GAJT-410ML for space-constrained military land applications.

Learn more at <https://hxgn.biz/2Q4fQcH>

An Attack Against Them All?

Drivers of Decisions to Contribute to NATO Collective Defense:

https://www.rand.org/pubs/research_reports/RR2964.html?utm_campaign=&utm_content=1567442280&utm_medium=rand_social&utm_source=linkedin

Trump Accidentally Revealed The Amazing Resolution Of U.S. Spy Satellites:

Accidentally?:

<https://www.forbes.com/sites/jonathanocallaghan/2019/09/01/trump-accidentally-revealed-the-amazing-resolution-of-u-s-spy-satellites/#71af261c3d89>

<https://www.linkedin.com/feed/>

US Space Command re-established as 11th Unified Combatant Command - GPS World:

In a move to enhance the United States' space superiority capabilities, the United States Space Command was formally re-established. Get more details.

<https://www.gpsworld.com/u-s-space-command-re-established-as-11th-unified-combatant-command/>

The world's most advanced nanotube computer may keep Moore's Law alive:

Moore's Law might be around for longer than you think, thanks to carbon nanotube chips.

https://www.technologyreview.com/s/614247/the-worlds-most-advanced-nanotube-computer-may-keep-moores-law-alive/?utm_medium=tr_social&utm_campaign=site_visitor.unpaid.engagement&utm_source=LinkedIn#Echobox=1567191264

In 1975, Pres. Gerald Ford promoted heroic United States Air Force fighter pilot and 1942 #TuskegeeUniversity grad Daniel "Chappie" James to the rank of four-star general. He was the first African American to hold that rank in the any U.S. military branch.

<https://lnkd.in/ejtuafd>

NASA, whole world will be watching Chandrayaan-2's landing on moon: Former astronaut:

<https://www.indiatoday.in/science/story/nasa-whole-world-will-be-watching-chandrayaan-2-landing-on-moon-former-astronaut-1594083-2019-09-01?>

World's smallest accelerometer points to new era in wearables, gaming:

<https://www.linkedin.com/pulse/worlds-smallest-accelerometer-points-new-era-gaming-lieberman-/>

<https://www.kth.se/en/aktuellt/nyheter/world-s-smallest-accelerometer-points-to-new-era-in-wearables-gaming-1.921647>

Crash Simulations with MATLAB:

https://www.mathworks.com/company/mathworks-stories/coding-the-perfect-car-crash.html?source=15574&s_eid=psm_15574

BeiDou-GLOASS synergies will offset dominance of US GPS:

<http://www.globaltimes.cn/content/1163458.shtml>

China, Russia to promote compatibility of BeiDou and GLOASS navigation systems:

<http://www.globaltimes.cn/content/1163367.shtml>

BeiDou chip helps detect illegal parking of shared bikes with centimeter-level positioning

<http://www.globaltimes.cn/content/1161419.shtml>

Galileo system's woes may provide opening for China's BeiDou

<http://www.globaltimes.cn/content/1157850.shtml>

US approves US\$3.3 billion sale of anti-ballistic missiles to Japan

Read more at <https://www.channelnewsasia.com/news/asia/us-approves-us-3-3-billion-sale-of-anti-ballistic-missiles-to-11847670>:

Air Force changes message on Space Force amid criticism it stifled debate - SpaceNews.com:

So does that mean they'll let serving officers who are opposed to a Space Force also speak their minds publicly?

<https://spacenews.com/air-force-changes-message-on-space-force-amid-criticism-it-stifled-debate/>

\Less is more - New workstations could clear the clutter for air traffic controllers | Raytheon:

Few professions demand as much multitasking as air-traffic controllers. To lessen their burden, we've built a prototype workstation that combines the clutter of monitors, trackballs and keyboards into a much cleaner configuration, using tablet and touchpad technology. <https://rtn.co/2zWGqg>

https://www.raytheon.com/news/feature/less-more?utm_source=linkedin&utm_medium=organic&utm_campaign=INNOVATIONS&utm_content=IIS_NMS_STARS*N/A*&utm_id=2603368802_2603368804_5&linkId=73059956

'BeiDou + GLONASS Better than GPS' - Global Times (China)

<https://www.linkedin.com/pulse/beidou-glonass-better-than-gps-global-times-china-dana-agoward/?trackingId=Jc%2BKPDkPYet%2BFIngdGO6Tg%3D%3D>

Japanese Flying Car Ready For The Future:

<https://www.linkedin.com/pulse/japanese-flying-car-ready-future-simon-jones/>

<https://www.linkedin.com/pulse/strange-gps-hong-kong-china-government-responsible-dana-agoward/?trackingId=AnY62iIPfZXSHcHetzjxMA%3D%3D>

Air Force and DARPA prepare to shoot new hypersonic weapon:

<https://www.foxnews.com/tech/air-force-and-darpa-prepare-to-shoot-new-hypersonic-weapon>

Dynetics, Raytheon producing glide bodies for hypersonic weapon prototypes:

<https://www.upi.com/Defense-News/2019/09/03/Dynetics-Raytheon-producing-glide-bodies-for-hypersonic-weapons-prototypes/1041567522593/>

US DOT moves aggressively on GPS backup, RFP this month - GPS World:

<https://www.linkedin.com/pulse/us-dot-moves-aggressively-gps-backup-rfp-month-world-dana-a-goward/>

<https://www.gpsworld.com/us-dot-moves-aggressively-on-gps-backup-rfp-this-month/>

<https://www.transportation.gov/content/procurement-forecast-opportunity-347991-v3452012>

DOT Ready to Launch GPS (backup) Demo Contract Process - Inside GNSS:

<https://www.linkedin.com/pulse/dot-ready-launch-gps-backup-demo-contract-process-inside-goward/>

<https://insidegnss.com/dot-ready-to-launch-gps-demo-contract-process/>

https://www.fbo.gov/index?s=opportunity&mode=form&id=5996e9b267390cc637e90a6f605ebf7b&tab=core&_cview=0

Raytheon to Demo Unmanned Single-Sortie Mine Sweeping for Navy at ANTX 2019:

https://seapowermagazine.org/raytheon-to-demo-unmanned-single-sortie-mine-sweeping-for-navy-at-antx-2019/?_rsc=4c9ac745-913d-4c88-a1b2-e7c867eb7729

New Combatant commander begins organizing USSPACECOM - GPS World:

The U.S. Space Command established two subordinate commands that will jointly provide support to the new Unified Combatant Command. Read about the JTF-SD and CFSCC commands.

<https://www.gpsworld.com/new-combatant-commander-begins-organizing-usspacecom/>

Hypersonics by 2023:

<https://www.linkedin.com/pulse/hypersonics-2023-alvin-lieberman-/>

<https://www.dvidshub.net/news/338369/hypersonics-2023>