### NC

States ought to establish a new International Astronomical Union Centre for the Protection of the Dark and Quiet Sky from Satellite Constellation Interference including the development of a SatHub per our Hall et al evidence.

#### CP creates an international oversight body to track satellite orbital patterns – provides the best avenue for astronomical research and avoids collisions

Hall et al 10/29/21 (Jeffrey, Executive Director Lowell Observatory PhD Solar Astronomy from Pennsylvania State University, Constance Walker, Ph.D. (astrophysics), 1991, University of Arizona, Meredith Rawls, Research Scientist in the Department of Astronomy and a DiRAC Fellow, Jonathan McDowell, astrophysicist at the Harvard-Smithsonian Center for Astrophysics, Robert Seaman, PhD Physics University of Wyoming, Data Engineer and Co-Investigator at the Catalina Sky Survey, Aparna Venkatesan, Professor in the Department of Physics and Astronomy at the University of San Francisco, James Lowenthall, Mary Elizabeth Moses Professor of Astronomy, Richard Green, Director of the Large Binocular Telescope Observatory, Kelsie Krafton, PhD Physics Louisiana State University, Joel Parriot, Assistant Director for Federal R&D (American Astronomical Society, National Science Foundation National Optical-Infrared Astronomy Research Laboratory, "Report of the SATCON2 Workship 12-16 July 2021," https://noirlab.edu/public/media/archives/techdocs/pdf/techdoc031.pdf

3.1.1. Establish SatHub The main components of SatHub are Astronomical Data Repositories, an Orbital Solution Portal, Software Tools, a Training Curriculum, and support for Real-Time Collaboration. Each of these encompasses several critical modules — everything from queryable image databases to a developer guide for software contributors, to quick start recipes for observers equipped with various hardware, to a mechanism for submitting requests to observe satellites in a particular way. The Observations WG Report focuses on Astronomical Data Repositories, a Training Curriculum, and the Orbital Solution Portal, and we defer to the Algorithms WG Report and future IAU Centre for Software Tools and Real-Time Collaboration, respectively. SatHub components and organization are shown in the figure below. Astronomical Data Repositories support upload, query, preview, and download of most FITS optical/NIR observations and include services like Trailblazer, an open data repository of astronomical images containing satellite trails, which should launch in early 2022. They must also encompass wavelengths outside optical/ NIR including radio, space-based observations from observatories in LEO, non-image data products including spectra, and other formats including visual sightings/ DSLR images. Broad participation in SatHub is critical to minimizing duplicated effort and disseminate current impacts from a rapidly changing LEO satellite population. 3.1.2. Build a Training Curriculum Sharing data products and establishing SatHub are critical, but we must also train observers of all kinds to contribute to the global LEO satellite monitoring campaign. To accomplish this, we outline a training curriculum that can be adapted to suit a variety of observers. It includes a core curriculum with an introductory module and modules on observing satellites, reporting/sharing observations, and image/ data analyses. In addition, we outline advanced modules: software development, radio astronomy, and laws governing outer space. Finally, it will include appendices with Quick Start Recipes for astrophotographers, smaller telescope users, and larger research-grade telescope users, as well as links to related citizen science projects. 3.1.3. Best Practices for Operator Public Data Sharing The position of a satellite at a future time is forecast with a propagator algorithm that uses an orbital solution from the recent past. The SATCON1 Report concluded that it is essential for satellite operators to provide prompt, accurate, updated, and publicly available orbital solution data in a standardized way. To achieve this, we propose and justify four key implementation steps: 1. Operators should publicly provide orbital solutions every 8 hours or whenever a maneuver happens, whichever is first, and must include reasonable estimates of uncertainties with all orbital solutions. 2. In addition to orbital solutions, operators should publicly provide any other relevant metadata that may assist observers in assessing impacts on observations at all wavelengths. These may include, but are not limited to, reflectivity, bidirectional reflectance distribution function (BRDF), effective isotropic radiated power (EIRP), transmission bandpasses, and nominal flux density at different frequencies. 3. Operators should adopt standard formats for both ephemeris-style orbital solutions (state vectors of position and velocity data) and general perturbation-style orbital solutions (time-averaged Keplerian elements that include atmospheric drag that are presently provided in TLE3 format). We suggest a format like the plain text NASA Modified ITC Ephemeris format that SpaceX presently uses for the former, and strongly endorse the Celestrakrecommended Orbit Mean-Elements (OMM) format from Consultative Committee for Space Data Systems (CCSDS) 502.0-B-2 for the latter. 4.We must promptly establish a public Orbital Solution Portal website as part of SatHub. Satellite operators should pay for the hosting and upkeep of this website. It should retain rather than overwrite past orbital solutions and provide an easy lookup interface for data retrieval, and it should include an open source software tool that allows users to translate between ephemerides, general perturbations in the new OMM format, and oldstyle TLEs.

### Overview

#### CP creates an international SatHub program to share data, software, and facilitate communication between major space actors as well as provide training and educational tools.

#### That solves the aff

#### Collisions – issue with constellations isn’t the satellites, it’s the lack of oversight and tracking, CP shores up those capabilities by creating a massive regulatory body and tracking satellites closely to avoid collisions.

#### Astronomy – CP fiats a massive research agency, that is more than sufficient to solve any research issues about asteroid detection or deflection

#### Ozone – satellites that fail or crash are the ones that burn up and create negative ozone effects, CP neutralizes that threat by effectively reducing accident risk to 0% - no reason that satellites would have to reenter and burn up.

#### Err negative – solvency advocate is a massive group of experts collaborating from different countries agreeing that this program would resolve the underlying danger in satellite placement and research gaps. Aff evidence doesn’t assume more cooperation or an oversight body and educational cooperation of the CP

## NC

#### Global shipping is recovering now, but it’s tenuous – disruptions could collapse a uniquely fragile global shipping system

Fullard 1/4/22 (Matt, Business Development Director Noatum Logistics UK, BRC, "Pandemic Supply Chain Problems Won't Be Easily Fixed and May Continue," <https://brc.org.uk/news/the-retailer/pandemic-supply-chain-problems-won-t-be-easily-fixed-and-may-continue/> DD)

The world’s economy depends on global supply chains, but the pandemic is undermining the global infrastructure that supports supply chains, and trouble looks likely to continue well into 2022, with some expectation that disruption could continue into 2023. The continued disruption of supply chains explains why eCommerce orders are taking longer to arrive, why there’s empty store shelves, and why purchases may take months instead of weeks to arrive. This unprecedented situation is causing prices to rise at one of the fastest rates in a decade, contributing to inflation on a global scale. THE CAUSES The disruption began with the economic upheaval of the pandemic. But it is now being made worse by the strength of the economic rebound, a shortage of workers, and a transportation system that is overstressed. Last year when consumers were locked down, no longer able to spend money on going out and services, they spent instead on clothing, products and electronic goods. Having laid up vessels when China first locked down last January, the shipping lines were unprepared to deal with the sudden (and sustained) consumer-driven demand for space that began in the 2nd quarter, especially with many of their empty containers out of position. The situation was exacerbated by the shortage of supply chain workers, owing to COVID and COVID-safe working practices, which is when ports, inland terminals and warehouses began to get congested. The global fleet of passenger aircraft were grounded at the beginning of the pandemic, removing over 50% of (belly-hold) cargo capacity at a stroke, crippling the time-sensitive mode and pushing even more demand to the ocean mode. DISRUPTION Usually interruptions to global shipping are overcome without lasting impact, but with supply chain operations so disrupted, since the beginning of 2020, even the slightest issue is having a disproportionate impact, with ripple effects, that spread disruption much wider than normal. In March, the EverGiven blocked the Suez Canal, disrupting trade flows between Asia and Europe, then COVID cases forced a partial shutdown of Shanghai, one of the world’s largest ports, followed by Ningbo, the second largest container port. Rolling lockdowns have shut down swathes of Asia, with parts of China entering lockdown, then opening, just to be shut down again and now factories in mainland China, are struggling with a series of power shortages. Laden container ships are idle, waiting for berth space at ports in North America, Asia and Europe, with schedule reliability at all-time lows and shipping lines skipping the busiest ports. The effect of this disruption is cumulative and it comes as volumes continue to rebound due to the strong recovery in Europe and North America. It is effectively reducing capacity across the container supply chain by substantially slowing the movement of vessels and containers around the world. With limited capacity and sustained high demand, supply and demand has pushed freight rates to levels never seen before, and as that additional cost is inevitably passed on, inflation increases. Shipping containers have become scarce. They may be sitting unopened for a week or two and thus cannot be put to work for another shipment, which is why lines have begun to restrict free time and enforce demurrage contracts. The problem is compounded by the HGV crisis and shortage of truck drivers available for container transport, with bookings made weeks in advance and containers still waiting to be picked up. Obtaining vessel space continues to be challenging, with delays along the supply chain and high-cost levels, that may be impacted further by peak season traffic. OUTLOOK New-build container vessels will start to come on stream from next year, though it should be noted that much of this new capacity could reignite the current global port disruption, because many ports do not have the infrastructure, cranes, equipment or capability to handle Ultra Large Container Ship (ULCS) vessels, that carry more than 20,000 containers. And with just 9 shipping lines, across 3 alliances, controlling over 90% of global trade, managing their capacity effectively means they will enter the post-pandemic era in a much stronger position and ensure they maintain healthy returns. With air passenger travel gradually reopening, more belly-hold capacity will become available on long-haul routes, including the critical trans-Atlantic and Asian routes. Sea and air freight will eventually come back into balance, but for now the pandemic’s consequences will be measured in shipping costs, prices, inflation and in delays. The pandemic supply chain challenges that have driven up prices for consumers and slowed the global economic recovery, will lessen in time. But recovery remain tenuous and easily set back by unseen events and weak links, like the shortage of HGV drivers in the UK and China’s drive for zero COVID cases. By 2023 (or even possibly late 2022) the COVID19 situation should be under control and consumer demand settled, providing stability in global shipping.

#### Megaconstellations create more autonomous communication systems globally which is key for accurate and immediate data transmission

Poole et al 21 (Carl, Captain USSF and orbital analyst and holds a master of science from the Air Force Institute of Technology, Robert Bettinger, Major USAF and assistant professor of astronautical engineering and curriculum chair for the astronautical engineering degree program at the Air Force Institute of Technology, Mark Reith, adjunct professor of systems engineering Air Force Institute of Technology, Air & Space Power Journal, "Shifting Satellite Control Paradigms: Operational Cybersecurity in the Age of Megaconstellations," <https://www.airuniversity.af.edu/Portals/10/ASPJ/journals/Volume-35_Issue-3/T-Poole.pdf> DD)

The development of constellations consisting of thousands of individual satellites controlled by one operator is no longer a wistful dream of science fiction or avant-garde technologists. With the introduction of LEO constellations such as “Starlink” or “OneWeb,” the concept of megaconstellations is becoming a reality, precipitating the rise of megaconstellations as a potential means to provide regional and global telecommunications services.3 In Asia, China Telecom reportedly plans to create a 10,000-satellite megaconstellation called “China StarNet” in the next 5−10 years.4 In late 2020, the European Union revealed plans to initiate a program to develop a telecommunications megaconstellation to establish “European digital sovereignty.”5 The proliferation of LEO with tens of thousands of satellites will require increasing levels of automation to handle intraconstellation operations and to enable future constellation growth and system safety in a given orbital altitude regime. The creation of megaconstellations is the result of two factors. First, the shift in the commercial space industry to create standardized, rapidly produced, and highvolume space-capable vehicles has caused both the size and cost of individual satellites to decrease drastically.6 The ability to buy commercial-off-the-shelf components instead of making proprietary hardware lowers the cost of research and development, thus accelerating system production. The second factor is a function of satellite size. As the satellite form factor decreases, more satellites can fit inside the payload fairing of a single launch vehicle, which, in turn, drives down the cost per satellite to reach orbit. Overall, the costs of satellite design, production, and space launch are decreasing, thus allowing for the nearly exponential proliferation of near-Earth orbital regimes. Consequently, the increase in satellites will lead to an escalation of costs associated with operations if the current satellite control paradigm does not evolve to meet the challenges of proliferated orbits. The evolution of satellite control from human-in-the-loop commands to automation will require the megaconstellation, in concert with the ground communications networks, to deconflict satellite pass times over receiver antennas at specified ground stations.7 By definition, a “pass time” is the time each satellite needs to downlink, or transmit, data to the ground antenna, as well as to uplink, or receive, commands from the ground station. Depending on the mission and amount of information transmitted, timing is critical. In addition, the orbital altitude of a given satellite determines the access durations to each ground antenna: the lower the satellite altitude, the faster the satellite passes over a given point on the ground. This planning will be increasingly important as the communication bandwidths become more crowded due to more satellites flying within the ground receiver’s view. Since the early twenty-first century, an increase in CPU power has enabled the addition of programmable capabilities to onboard satellite subsystems.8 A growing number of satellites are now being equipped with onboard systems that resemble a standard personal computer.9 This design architecture, in turn, increases reliability. A satellite’s onboard system can now identify and correct for faults and adapt to changing parameters much faster than a human-in-the-loop system.10 A human-in-the-loop system is comparatively slower due to data transmission and analysis delays and the need for an extra layer of review to verify the correctness and validity of planned operations before command uplink. One of the most common satellite-control tasks is that of station keeping or maintaining a satellite’s predetermined, mission-centric orbital attitude and position. For megaconstellations, an attitude determination and control system may control all station-keeping operations. Due to an increase in ground-station demand resulting from a vastly greater number of contacts, each satellite will have to determine correct orbital attitude and position deviations autonomously to ensure continued constellation stability and mission functionality and to reduce the likelihood of satellite collisions.11 Shifting such attitude and orbit maintenance tasks away from the ground segment, however, will require the introduction of a robust fault- and error-alert architecture to identify and notify the human satellite operators of any anomalous events. Ultimately, raising more house-keeping commands into the purview of control automation will shift the satellite maintenance workload from continuous hands-on, day-to-day human operations to an on-call, human-response control structure. Greater automation will also remove the likelihood of an incomplete command sent by human operators or the need to check for unsafe commands before data uplink.12

#### That is key to the maritime industry – avoids accidents and provides necessary logistical support

Heinrich et al 21 (David, Human Factors Ph.D. candidate at Capitol Technology University. His professional background spans over 19 years in the United States Air Force as a fighter avionics technician, instructor, and satellite operations professional, Ian McAndrew, Dean of Doctoral Programs at Capitol Technology University. He has taught in universities worldwide and is a frequent keynote speaker at many International Conferences. He is a Fellow of the Royal Aeronautical Society and Chartered Mechanical and Electrical Engineer in the U.K, and Jeremy Pretty, Senior Program Manager with the United States Air Force Civil Service. His professional background includes over 15 years in program/project/product management within the U.S. Department of Defence on Aircraft and Information Technology systems, International Journal of Managing Information Technology Vol 13 No 3 August 2021, "HUMAN FACTORS CONSIDERATIONS IN SATELLITE OPERATIONS HUMAN-COMPUTER INTERACTION TECHNOLOGIES: A REVIEW OF CURRENT APPLICATIONS AND THEORY," <https://arxiv.org/ftp/arxiv/papers/2110/2110.04880.pdf> DD)

According to Årstad and Aven, complacency is “unintentional unawareness [which can only be diagnosed] in hindsight, from a distanced perspective” [20, p. 115]. The National Aeronautics and Space Administration (NASA) defines complacency as “overconfidence from repeated experience on a specific activity, complacency has been implicated as a contributing factor in numerous aviation accidents and incidents” [21, p. para.1]. Parasuraman et al. [22] referenced the prevalence of complacency throughout multiple aviation accident investigations lending credence to the importance of Dupont’s “Dirty Dozen” [4]. Prinzel cited crew complacency as often being “a contributing factor in aviation accidents” [23, p. 4]. Merritt et al. referenced “complacency, or sub-optimal monitoring of automation performance, [as being] cited as a contributing factor in numerous major transportation and medical incidents” [24, p. 1]. Overconfidence in highly reliable automated systems often leads to complacency issues [22].Complacency is often cited alongside boredom and procrastination[21, 23] . Prinzel found that those with low self-efficacy “suffered automation-induced complacency” and operated significantly better when working in high workload environments[25, p. 13]. Furthermore, Prinzel [23] also found that pilot workload over-saturation can increase, leading to an overburdened cognitive load. Conversely, boredom has been shown to increase when the operator defers to the machine due to the repetitive nature of automated tasks in a cognitively low-demand environment [26]. Aviation human factors incidents involving pilot complacency have been attributed to a failure to adequately correct automation errors [22, 24, 27]. Merritt et al. [24] highlighted that complacency could manifest due to a person’s inability to comprehend the occurrence of an error or exhibit a prolonged response to an error or stimuli. Beyond prolonged reaction to an automation failure, failing to act may be attributed to both commission and omission errors [23, 24, 28].Errors of commission happen when the HITL makes a mistake or error due to incorrect decision-making. Errors of omission occur when the human does nothing when they should have[24, 29]. Complacency research pertaining to maritime shipping operations identifies similar outcomes, which serves to highlight Dupont’s “Dirty Dozen” [4, 30]. Attempting to fill gaps in maritime research, Bielic et al.[31]studied technology, leadership, management, and self-induced complacency during their study of complacency in maritime accidents. Bielic et al.[31]cite research by Turan et al.[30], who found that over 80% of maritime shipping incidents were attributable to human or organizational error, of which 6% could be attributed to complacency. The research referenced an overreliance on automation as a leading cause of technology complacency. Furthermore, leadership complacency may increase the risk of complacency in the same manner as poor team dynamics, toxic hierarchy, and steep authority gradient, as seen in aviation sources [31]. Leadership complacency occurs when the leader or manager possesses an inadequate leadership style. Workers may become apprehensive about going totheir leadership out of fear of being ignored or potential mistreatment[31]. Alternatively, leadership complacency may occur when leaders are not professionally challenged during critically sensitive moments. During the events leading up to the Chernobyl disaster, workers were discouraged from having a questioning attitude, and the overall lack of open communication resulted in increased loss of life due to the amount of time it took the workers to react to the situation[31, 32]. Satellite operations assets rely on a system-of-systems to provide autonomy due to the inherent complexity of satellite electronics and the inability to conduct on-orbit servicing. Due to this complexity, human satellite operators and the spacecraft, or autonomous agent, function as a team [33]. While not explicitly stated, the concept of human operators and autonomous agents working together points to the idea of crew resource management (CRM), where both entities operate as a crew working toward a common goal [34, 35, 36, 37]. Communication between the autonomous agent and humans exists within the environment, as seen in the human factors SHELL model where the liveware, hardware, and software work together [18].Complacency may occur due to automation bias when humans defer decision-making and authority to more complex autonomous agents [38]. Lyell and Coiera [38]found that task complexity and difficulty play a significant role in automation bias due to the level of difficulty present when monitoring and interpreting automated aids in the healthcare field.

#### Container shipping collapse triggers deglobalization

Economist 21 (Economist, “A perfect storm for container shipping Will prolonged disruptions shift the pattern of trade?”, <https://www.economist.com/finance-and-economics/a-perfect-storm-for-container-shipping/21804500>, September 18, 2021 DD)

A GIANT SHIP wedged across the Suez canal, record-breaking shipping rates, armadas of vessels waiting outside ports, covid-induced shutdowns: container shipping has rarely been as dramatic as it has in 2021. The average cost of shipping a standard large container (a 40-foot-equivalent unit, or FEU) has surpassed $10,000, some four times higher than a year ago (see chart). The spot price for sending such a box from Shanghai to New York, which in 2019 would have been around $2,500, is now nearer $15,000. Securing a late booking on the busiest route, from China to the west coast of America, could cost $20,000. Listen to this story Enjoy more audio and podcasts on iOS or Android. In response, some companies are resorting to desperate measures. Peloton, a maker of pricey exercise bikes, is switching to air freight. But costs are also sky-high as capacity, half of it usually provided in the holds of passenger jets, is constrained by curbs on international flights. Home Depot and Walmart, two American retailers, have chartered ships directly. Pressing inappropriate vessels into service has proved near-calamitous. An attempt in July to carry containers on a bulk carrier, which generally carts coal or iron ore, was hastily abandoned when the load shifted, forcing a return to port. More containers are travelling across Asia by train. Some are even reportedly being trucked from China to Europe then shipped across the Atlantic to avoid clogged Chinese ports. **Trains, planes and lorries can only do so much, especially when it comes to shifting goods halfway around the planet. Container ships lug around a quarter of the world’s traded goods by volume and three-fifths by value. The choice is often between paying up and suffering delays, or not importing at all. Globally 8m TEUS (20-foot-equivalent units) are in port or waiting to be unloaded, up by 10% year-on-year. At the end of August over 40 container ships were anchored off Los Angeles and Long Beach. These serve as car parks for containers, says Eleanor Hadland of Drewry, a shipping consultancy, in order to avoid clogging ports that in turn lack trains or lorries to shift goods to warehouses that are already full. The “pinch point”, she adds, “is the entire chain”. For years container shipping kept supply chains running and globalisation humming. Shipping was “so cheap that it was almost immaterial”, says David Kerstens of Jefferies, a bank. But disruption after disruption means that the metal boxes are losing their reputation for low prices and reliability. Few experts think things will get better before early next year. The dislocations could even hasten a reordering of global trade.** Shipping is so strained in part because the industry, which usually steams from short-lived boom to sustained bust, was enjoying a rare period of sanity in the run-up to the pandemic. Stephen Gordon of Clarksons, a shipbroker, notes that by 2019 it was showing self-discipline, with the level of capacity and the order book for new ships under control. Then came covid-19. Shipping firms, expecting a collapse in trade, idled 11% of the global fleet. In fact, trade held up and shipping rates started to climb. And, flush with stimulus cash, Americans started to spend. In the first seven months of 2021, cargo volumes between Asia and North America were up by 27% compared with pre-pandemic levels, according to BIMCO, a shipowners’ association. Port throughput in America was 14% higher in the second quarter of 2021 than in 2019. There has been little growth elsewhere: throughput in northern Europe is 1% lower. Yet rates on all routes have rocketed (see map), because ships have set sail to serve lucrative transpacific trade, starving others of capacity. A system stretched to its limits is subject to a “cascading effect”, says Eytan Buchman of Freightos, a digital-freight marketplace. Rerouting and rescheduling would once have mitigated the closure of part of Yantian, one of China’s biggest ports, in May and then Ningbo, another port, in August after covid-19 outbreaks. But without spare capacity, that is impossible. “All ships that can float are deployed,” remarks Soren Skou, boss of Maersk, the world’s biggest container-shipping firm. Empty containers are in all the wrong places. Port congestion puts ships out of service. The average door-to-door shipping time for ocean freight has gone from 41 days a year ago to 70 days, says Freightos. Some observers think normality may return after Chinese new year next February. Peter Sand of BIMCO says disruptions could even take a year to unwind. Lars Jensen of Vespucci Maritime, an advisory firm, notes that a dockers’ strike on America’s west coast in 2015 caused similar disruption, albeit only in the region. It still took six months to unwind the backlog. On the demand side much depends on whether the American consumer’s appetite for buying stuff continues. Although retail sales fell in July, they are still 18% above pre-pandemic levels, points out Oxford Economics, a consultancy. But even if American consumer demand slackens, firms are set to splurge as they restock inventories depleted by the buying spree and prepare for the holiday season at the end of the year. And there are signs that demand in Europe is picking up. In a sea of uncertainty, one bedrock remains. The industry, flush with profits, is reacting customarily, setting an annual record for new orders for container-ship capacity in less than eight months of this year, says Mr Sand. But with a two-to-three-year wait, this release valve will not start to operate until 2023. And the race to flood the market may not match torrents of the past. There are far fewer shipyards today: 120 compared with around 300 in 2008, when the previous record was set. And shipping, responsible for 2.7% of global carbon-dioxide emissions, is under pressure to clean up its act. Tougher regulations come into force in 2023. The upshot is that the industry “will remain cyclical”, but with rates normalising at a higher level, says Maersk’s Mr Skou. Discipline in both ordering and managing capacity may prove more permanent, aided by consolidation within the industry. The impact of higher shipping costs depends on the good being transported. Those hoping to import cheap and bulky things like garden furniture might be in for a long wait. Mr Buchman notes that current spot rates might add $1,000 to the price of a sofa travelling from China to America. The effects on product prices so far may have been dampened: around 60% of goods are subject to contractual arrangements with shipping rates agreed in advance and only 40% to soaring spot prices. Boxed in Nonetheless, for most products, shipping costs tend to be a small percentage of the overall cost. The boss of a large global manufacturer based in Europe says the extreme costs now are “bearable”. Nor might shipping rates rise much more even if disruptions continue. CMA CGM, the third-largest container-shipping firm in the world, stunned industry watchers on September 9th when it said that it would cap spot rates for ocean freight. Hapag-Lloyd, the fifth-largest, rapidly followed suit. Decarbonisation costs mean rates will eventually settle at higher levels than those before the pandemic. Yet research by Maersk suggests that this may not affect customers much. Even if sustainable fuel cost three times as much as the dirty stuff, increasing per-container fuel costs to $1,200 across the Pacific, for a container loaded with 8,000 pairs of trainers, the impact on each item would be minimal. Instead it is the problem of reliability that may change the way firms think. “Just in time” may give way to “just in case”, says Mr Sand, as firms guard against supply shortages by building inventories far above pre-pandemic levels. Reliability and efficiency might also be hastened by the use of technology in an industry that has long resisted its implementation. As Fraser Robinson of Beacon, another digital freight forwarder, points out, supply chains can be made sturdier by using data to provide better “visibility” such as over which suppliers and shipping companies do a better or worse job of keeping to timetables and ordering goods earlier. There is so far little evidence of “nearshoring”, except in the car industry, says Mr Skou. But the combination of trade war, geopolitics and covid-19 may together lead trade patterns to tilt away from China. Some Chinese firms and the companies they supply are relocating production to lower-cost countries to diversify supply chains and circumvent trade barriers. Mr Kerstens of Jefferies notes that after America under President Donald Trump imposed tariffs on China the volume of trade from China to America fell by 7% in 2019, but American imports remained stable overall as places like Vietnam and Malaysia took up the slack. Hedging against covid-19 shutdowns, particularly given China’s zero tolerance for infections, could provide another reason to move away. For their part, shipping firms may be preparing for more regionalised trade. The order book is bulging for ships of 13,000-15,000 TEU, smaller than the mega-vessels that can only be handled at the biggest ports. Vietnam opened a new deepwater terminal in January, which can handle all but those largest ships. **Finding new manufacturers is hard, however, especially for complex products. And building buffers into supply chains is costly. But conversations about deglobalising are said to be starting among some makers of low-cost clothing and commodity goods. If high costs and delays persist, some will judge that the benefits of proximity to suppliers outweigh the costs of bringing in goods made far away. With few alternatives to ships, the only choice will be to move the factories that make them.**

#### Deglobalization shocks ensures great power conflict – empirics prove

WI 16 (DTN Washington Insider, DTN delivers accurate, objective, real-time, and actionable insights to increase our 2 million customers’ confidence and support their business decision, “Washington Insider: Implications of Deglobalization”, <https://www.dtnpf.com/agriculture/web/AG/columns/washington-insider/article/2016/11/14/implications-deglobalization>, November 14, 2016 DD)

While the trade confrontation has tended to focus on mechanics and politics in many urban dailies, an exception is an **OpEd by Ruchir Sharma, chief global strategist at Morgan Stanley. He writes in Sunday's New York Times that the world goes through long cycles of globalization and deglobalization, so the current turnaround is certainly not unique. But, the cycles are powerful.** **He thinks that globalization generates prosperity and benefits for millions--but that the elite gain the most and so inequality grows and this stirs "pockets of fierce resentment" and to "great shocks" in Democracies. The discontented often turn to nationalism and controls for trade, global banks and immigrants and "globalization stalls." Such a shock came in 1914, he says, when the outbreak of World War I ended an extraordinary four-decade period of rising migration and trade, a clear parallel to the globalization boom that gained momentum in the 1980s and stalled in 2008. Since then, globalization has been in retreat and "populism has been on the march" in the United States, Britain, Italy, France and Germany. He argues that the shock in 1914 continued for three decades and weakened the world economy enough to feed resentments that erupted into World War II. Now, the retreat that began in 2008 is still gaining strength, he says, but it is time to recognize the likely fallout, "which is slower growth, higher inflation and rising conflict." Both booms were driven by changing technology, including most recently, container ships, the internet and new global trade rules that opened the world's most populous country, China, to commerce.** Before 1914, there were steamships and the "Victorian internet," the telegraph along with novel rules that opened the 19th century's largest economy, Britain, to imports. By the eve of World War I, the world was in some ways as connected as now. There also were social tensions. In the early 20th century, the share of income going to the richest 1 percent of Americans rose steadily from 1870 to a peak of nearly 20 percent in the late 1920s, as global commerce created a "gilded age" plutocracy. Popular resentment pushed politicians to seal the borders, particularly after 1929 when the economy crashed. As America turned inward, Congress passed the sweeping Smoot-Hawley Tariff Act in 1930, prompting a global trade war, Sharma says. Measured as a share of the world economy, trade fell to a low of 10 percent in 1933. That year, Congress also passed the Glass-Steagall Act, which barred big banks from the investment business. After the war, it took decades for the flow of trade, money and people to regain momentum. Global trade did not recover to its 1914 peak until the 1970s; and capital mobility, the scale and ease of money flows, did not recover until the 1990s. Today, 2008 looks to Sharma to have been "as clear a turning point as 1914." With global demand weak, and many nations erecting import barriers, trade is slumping. Measured as a share of global gross domestic product, trade had doubled from 30% in 1973 to 60% in 2008—but, since has dropped to 55%. **Also, the world's major economies have imposed hundreds of protectionist measures since 2008, led by India, Russia, China and the United States. While there are many causes of job declines, he says the political reality remains that the tide has turned against immigrants and trade. It is time to recognize the implications of deglobalization.**

## case

#### The standard is maximizing expected wellbeing.

#### Extinction comes first!

**Pummer 15** [Theron, Junior Research Fellow in Philosophy at St. Anne's College, University of Oxford. “Moral Agreement on Saving the World” Practical Ethics, University of Oxford. May 18, 2015] AT

**There appears to be lot of disagreement in moral philosophy. Whether these many apparent disagreements are deep and irresolvable, I believe there is at least one thing it is reasonable to agree on right now**, whatever general moral view we adopt**: that it is very important to reduce the risk that all intelligent beings on this planet are eliminated by an enormous catastrophe, such as a nuclear war.** How we might in fact try to reduce such existential risks is discussed elsewhere. My claim here is only that **we – whether we’re consequentialists, deontologists, or virtue ethicists – should all agree that we should try to save the world.** According to consequentialism, we should maximize the good, where this is taken to be the goodness, from an impartial perspective, of outcomes. **Clearly one thing that makes an outcome good is that the people in it are doing well. There is little disagreement here.** If the happiness or well-being of possible future people is just as important as that of people who already exist, and if they would have good lives, it is not hard to see how **reducing existential risk is easily the most important thing in the whole world. This is for the familiar reason that there are so many people who could exist in the future – there are trillions upon trillions… upon trillions. There are so many possible future people that reducing existential risk is arguably the most important thing in the world, even if the well-being of these possible people were given only 0.001% as much weight as that of existing people.** Even on a wholly person-affecting view – according to which there’s nothing (apart from effects on existing people) to be said in favor of creating happy people – the case for reducing existential risk is very strong. As noted in this seminal paper, **this case is strengthened by the fact that there’s a good chance that many existing people will, with the aid of life-extension technology, live very long and very high quality lives. You might think what I have just argued applies to consequentialists only. There is a tendency to assume that, if an argument appeals to consequentialist considerations (the goodness of outcomes), it is irrelevant to non-consequentialists. But that is a huge mistake.** **Non-consequentialism is the view that there’s more that determines rightness than the goodness of consequences or outcomes; it is not the view that the latter don’t matter.** Even John Rawls wrote, “**All ethical doctrines worth our attention take consequences into account in judging rightness. One which did not would simply be irrational, crazy.**” **Minimally plausible versions of deontology and virtue ethics must be concerned in part with promoting the good, from an impartial point of view.** **They’d thus imply very strong reasons to reduce existential risk**, at least when this doesn’t significantly involve doing harm to others or damaging one’s character. What’s even more surprising, perhaps, is that even if our own good (or that of those near and dear to us) has much greater weight than goodness from the impartial “point of view of the universe,” indeed even if the latter is entirely morally irrelevant, we may nonetheless have very strong reasons to reduce existential risk. **Even egoism, the view that each agent should maximize her own good, might imply strong reasons to reduce existential risk.** It will depend, among other things, on what one’s own good consists in. If well-being consisted in pleasure only, it is somewhat harder to argue that egoism would imply strong reasons to reduce existential risk – perhaps we could argue that one would maximize her expected hedonic well-being by funding life extension technology or by having herself cryogenically frozen at the time of her bodily death as well as giving money to reduce existential risk (so that there is a world for her to live in!). I am not sure, however, how strong the reasons to do this would be. But views which imply that, if I don’t care about other people, I have no or very little reason to help them are not even minimally plausible views (in addition to hedonistic egoism, I here have in mind views that imply that one has no reason to perform an act unless one actually desires to do that act). **To be minimally plausible, egoism will need to be paired with a more sophisticated account of well-being.** To see this, it is enough to consider, as Plato did, the possibility of a ring of invisibility – **suppose that, while wearing it, Ayn could derive some pleasure by helping the poor, but instead could derive just a bit more by severely harming them. Hedonistic egoism would absurdly imply she should do the latter. To avoid this implication, egoists would need to build something like the meaningfulness of a life into well-being**, in some robust way, where this would to a significant extent be a function of other-regarding concerns (see chapter 12 of this classic intro to ethics). But **once these elements are included, we can (roughly, as above) argue that this sort of egoism will imply strong reasons to reduce existential risk.** Add to all of this Samuel Scheffler’s recent intriguing arguments (quick podcast version available here) that most of what makes our lives go well would be undermined if there were no future generations of intelligent persons. On his view, my life would contain vastly less well-being if (say) a year after my death the world came to an end. So obviously if Scheffler were right I’d have very strong reason to reduce existential risk. **We should also take into account moral uncertainty.** **What is it reasonable for one to do, when one is uncertain not (only) about the empirical facts, but also about the moral facts?** I’ve just argued that **there’s agreement among minimally plausible ethical views that we have strong reason to reduce existential risk – not only consequentialists, but also deontologists, virtue ethicists, and sophisticated egoists should agree.** But **even those (hedonistic egoists) who disagree should have a significant level of confidence that they are mistaken, and that one of the above views is correct. Even if they were 90% sure that their view is the correct one** (and 10% sure that one of these other ones is correct), **they would have pretty strong reason, from the standpoint of moral uncertainty, to reduce existential risk.** Perhaps most disturbingly still, **even if we are only 1% sure that the well-being of possible future people matters, it is at least arguable that, from the standpoint of moral uncertainty, reducing existential risk is the most important thing in the world.** Again, this is largely for the reason that there are so many people who could exist in the future – there are trillions upon trillions… upon trillions. (For more on this and other related issues, see this excellent dissertation). Of course, it is uncertain whether these untold trillions would, in general, have good lives. It’s possible they’ll be miserable. **It is enough for my claim that there is moral agreement in the relevant sense if**, at least given certain empirical claims about what future lives would most likely be like, **all minimally plausible moral views would converge on the conclusion that we should try to save the world.** While there are some non-crazy **views that place significantly greater moral weight on avoiding suffering than on promoting happiness**, for reasons others have offered (and for independent reasons I won’t get into here unless requested to), they nonetheless **seem to be fairly implausible views.** And **even if things did not go well for our ancestors, I am optimistic that they will overall go fantastically well for our descendants, if we allow them to. I suspect that most of us alive today – at least those of us not suffering from extreme illness or poverty – have lives that are well worth living, and that things will continue to improve.** Derek Parfit, whose work has emphasized future generations as well as agreement in ethics, described our situation clearly and accurately: “We live during the hinge of history. **Given the scientific and technological discoveries of the last two centuries, the world has never changed as fast.** We shall soon have even greater powers to transform, not only our surroundings, but ourselves and our successors. **If we act wisely in the next few centuries, humanity will survive its most dangerous and decisive period.** Our descendants could, if necessary, go elsewhere, spreading through this galaxy…. **Our descendants might, I believe, make the further future very good. But that good future may also depend in part on us. If our selfish recklessness ends human history, we would be acting very wrongly.**” (From chapter 36 of On What Matters)

### NC – No Debris Risk

#### Cleanup is working – multiple countries actively co-operate, treaties solve, and new tech is more careful

Paradise 15 (Lee A., writer for Science Clarified encyclopedia. 2001, accessed July 29 "Does the accumulation of "space debris" in Earth's orbit pose a significant threat to humans, in space and on the ground?" [www.scienceclarified.com/dispute/Vol-1/Does-the-accumulation-of-space-debris-in-Earth-s-orbit-pose-a-significant-threat-to-humans-in-space-and-on-the-ground.html](http://www.scienceclarified.com/dispute/Vol-1/Does-the-accumulation-of-space-debris-in-Earth-s-orbit-pose-a-significant-threat-to-humans-in-space-and-on-the-ground.html) DD)

In addition, space agencies around the world have taken steps to reduce space clutter. The United States, for example, has taken an official stand that is outlined in the 1996 National Space Policy that clearly states: "The United States will seek to minimize the creation of new orbital debris." For example, space mechanics are far more careful with regard to their tools. In the past, space mechanics sometimes let go of their tools and were unable to recover them. Strident efforts are now made to retain all objects used to repair satellites and conduct other missions. The Russians have also agreed to do their part. They used to purposely destroy their equipment in space to prevent it from falling into the wrong hands, but now refrain from that practice. Newly designed crafts and operating procedures also play a part in helping to keep space clean, while researchers continue to investigate safe ways to clean up the debris that currently exists. Everything from forcing the debris to reenter the atmosphere in a controlled manner to nudging it away from the Earth's orbit has been discussed. An activity such as collecting garbage from inside the space station and sending it back to Earth to burn up at reentry is one tangible way space explorers are helping to ensure the reduction of space clutter.¶ At this time there is no international treaty on how to deal with space debris; however, several nations have joined together to form the Inter-Agency Space Debris Coordination Committee (IADC). The IADC assesses the subject of space debris and how it should be handled in the future. Japan, like the United States, has developed a list of safety policies regarding space debris. Because this is ultimately a global issue, other countries such as France, The Netherlands, and Germany have jumped on the bandwagon with regard to addressing this issue.

#### Impact is overstated – constellation sats are significantly smaller which makes both their collision risk and potential debris output much smaller

Skibba 20 (Ramin, MIT Technology Review, "How satellite mega-constellations will change the way we use space," <https://www.technologyreview.com/2020/02/26/905733/satellite-mega-constellations-change-the-way-we-use-space-moon-mars/>DD)

“It’s a rather dynamic environment right now, with a lot of people starting to look at space as a means to answer certain business models,” says Roger Hunter, manager of NASA’s Small Spacecraft Technology program. “I call it the democratization of space.” Constellations offer new levels of versatility. Smaller, cheaper satellites—some just the size of a briefcase—can be arranged in different configurations depending on their goal. Lined up in a string that follows a single orbit, for example, a constellation can repeatedly photograph or surveil the same spot. Starlink, meanwhile, is arranged in a crisscross formation to blanket the planet with internet service. “I think that as an industry we’re trying to figure out how to increase the level of great space-based services that come down and help people on Earth every day, while doing it in a responsible and sustainable way in the orbital environment,” says Mike Safyan, vice president of launch and global ground systems at Planet Labs, which operates the second-largest constellation in operation.

#### Debris risk is overstated – objects are small compared to the size of space and even when collisions happen, damage is minimal

Paradise 15 (Lee A., writer for Science Clarified encyclopedia. 2001, accessed July 29 2015 "Does the accumulation of "space debris" in Earth's orbit pose a significant threat to humans, in space and on the ground?" [www.scienceclarified.com/dispute/Vol-1/Does-the-accumulation-of-space-debris-in-Earth-s-orbit-pose-a-significant-threat-to-humans-in-space-and-on-the-ground.html](http://www.scienceclarified.com/dispute/Vol-1/Does-the-accumulation-of-space-debris-in-Earth-s-orbit-pose-a-significant-threat-to-humans-in-space-and-on-the-ground.html) DD)

Considering the small size of objects like satellites or the shuttle placed against an environment as vast as space, the risk of severe collisions is minimal. Even when an object in space is hit by space debris, the damage is typically negligible even considering the high rate of speed at which the debris travels. Thanks to precautions such as debris shielding, the damage caused by space debris has been kept to a minimum. Before it was brought back to Earth via remote control, the MIR space station received numerous impacts from space debris. None of this minor damage presented any significant problems to the operation of the station or its various missions. The International Space Station (ISS) is designed to withstand direct hits from space debris as large as 0.4 in (1 cm) in size.¶ Most scientists believe that the number of satellites actually destroyed or severely damaged by space debris is extremely low. The Russian Kosmos 1275 is possibly one of these rare instances. The chance of the Hubble Space Telescope suffering the same fate as the Russian satellite is approximately 1% according to Phillis Engelbert and Diane L. Dupuis, authors of The Handy Space Answer Book . Considering the number of satellites and other man-made objects launched into space in the last 40 years, the serious risk posed to satellites is astronomically low.¶ In fact, monitoring systems such as the Space Surveillance Network (SSN) maintain constant track of space debris and Near Earth Orbits. Thanks to ground-based radar and computer extrapolation, this provides an early warning system to determine if even the possibility of a collision with space debris is imminent. With this information, the Space Shuttle can easily maneuver out of the way. The Space Science Branch at the Johnson Space Center predicts the chance of such a collision occurring to be about 1 in 100,000, which is certainly not a significant enough risk to cause panic. Soon the ISS will also have the capability to maneuver in this way as well.