

Outer Space in the Media Space: Russian & Chinese News Media Presentations of the Commercialization and Militarization of the Space Domain

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"It is common for them [U.S.] to dominate everywhere: not only in space - on land, on sea, in the air. And it is written in their doctrinal documents. So, there is nothing surprising here, but, I repeat, transferring this logic to outer space will certainly be a very, very serious risk for all mankind." Russian Foreign Minister, Sergey Lavrov- Gazeta Russian 4/20/2018

Executive Summary

This report details Russian and Chinese media presentations of operations and intentions in the space domain to their respective populations. These presentations provide us insight into how members of these nation states understand their government's intentions and activities in the space domain, the opportunities and challenges their government's face in approaching those intentions and activities, the alliances and norms necessary for space usage, and which actors are attempting to destabilizing the space domain. In both the Russian Federation and the People's Republic of China, state influence, oversight, and, in varying degrees, control of media mean that presented narratives are often quite likely to be a reflection of positions of the state itself; or, at least, that lean themselves toward the positions that the state wishes its population to understand. As a result of such oversight, often times even oppositional media sources are constrained to simply respond and react to the narratives reflecting positions of the state.

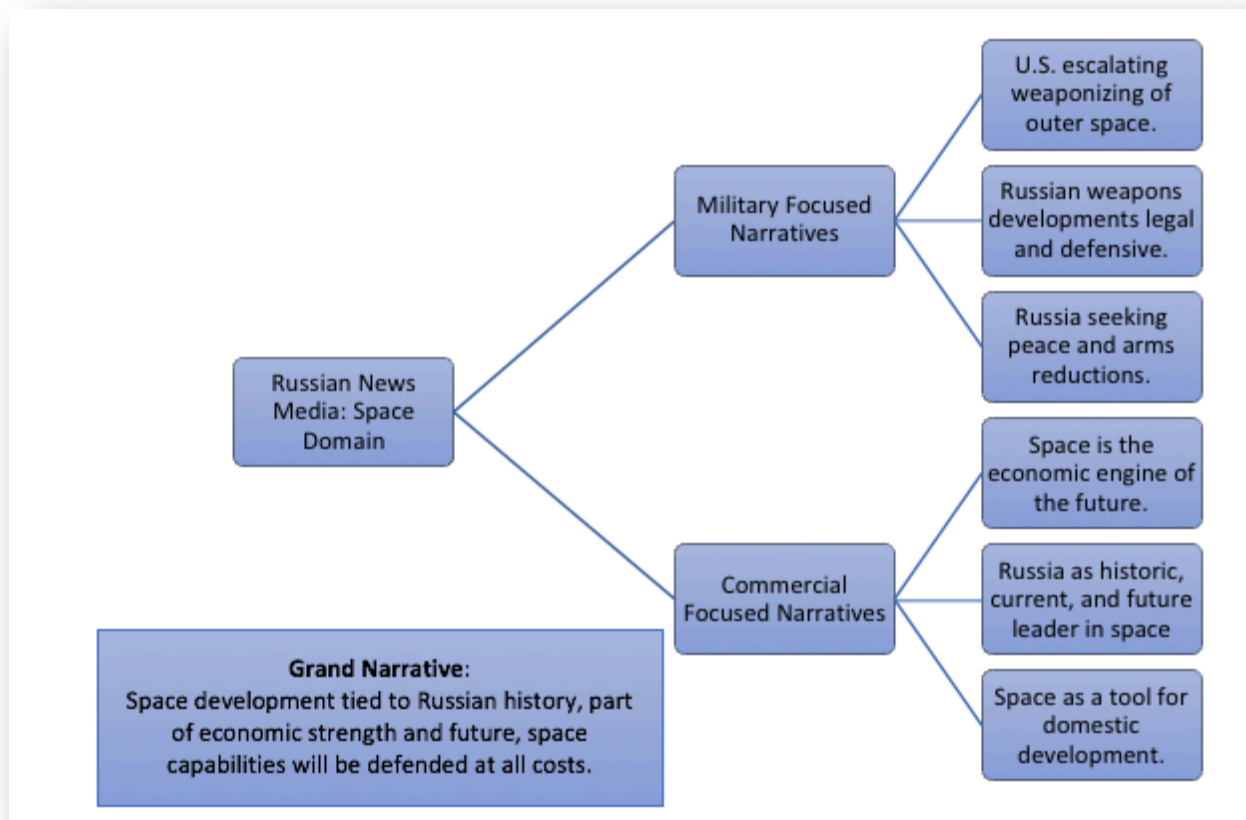
The narratives generated by these media are extremely important because how a population understands the scope, history, and significance of an issue or event, in many ways dictates how a government can respond to changes, challenges, and opportunities related to those issues or events. Media narratives in a managed state thus become a sort of self-created box of responses and directions that state can take toward a given issue or event. The ability to look inside those narrative boxes provides insights into how to best approach an issue or event, in relation to such managed states, because, in many ways, we can anticipate the responses they themselves have committed to their populations regarding those items.

This report tracks Russian and Chinese media presentations of the space domain from September 2017 to April 2018, and further includes analyses of government issued documents related to space dating back to 2014 in order to provide context to the contemporary data. Researchers conducted a content analysis on media presentations related to the questions posed by the SMA group, as well as qualitative reads of the media presentations of the space domain toward identification of the strategic narratives used.

Generally speaking, the results of this report show media in both the Russian Federation and the People's Republic of China present the militarization of outer space as being led, and instigated by, the United States. Escalations between the U.S. and Russia over events in Syria led Russian media to present the U.S. as much more aggressive and unstable compared to presentations in Chinese media. Media in both nations present the development of offensive and defensive space related armaments as being in response to the actions of the United States in the space domain. Further, media in both nations overwhelmingly project their governments as seeking peaceful space developments, political alliances and treaties to de-weaponize outer space. While media in both nations demonstrate their nation as a leader in outer space, Russian media project far more concern for the economic benefits of commercial space development; while Chinese media are more likely to present economic incentives for commercial developments as part of larger geo-political partnerships.

Overall Findings

Russian Narratives and Overall Findings:



Overall, Russian news media present the Russian government as heavily invested in developing the space capabilities of the nation. **Outer space is shown as an area of historic Russian technological innovation and leadership, a focus of national pride to be built upon toward a space related economy of the future.**

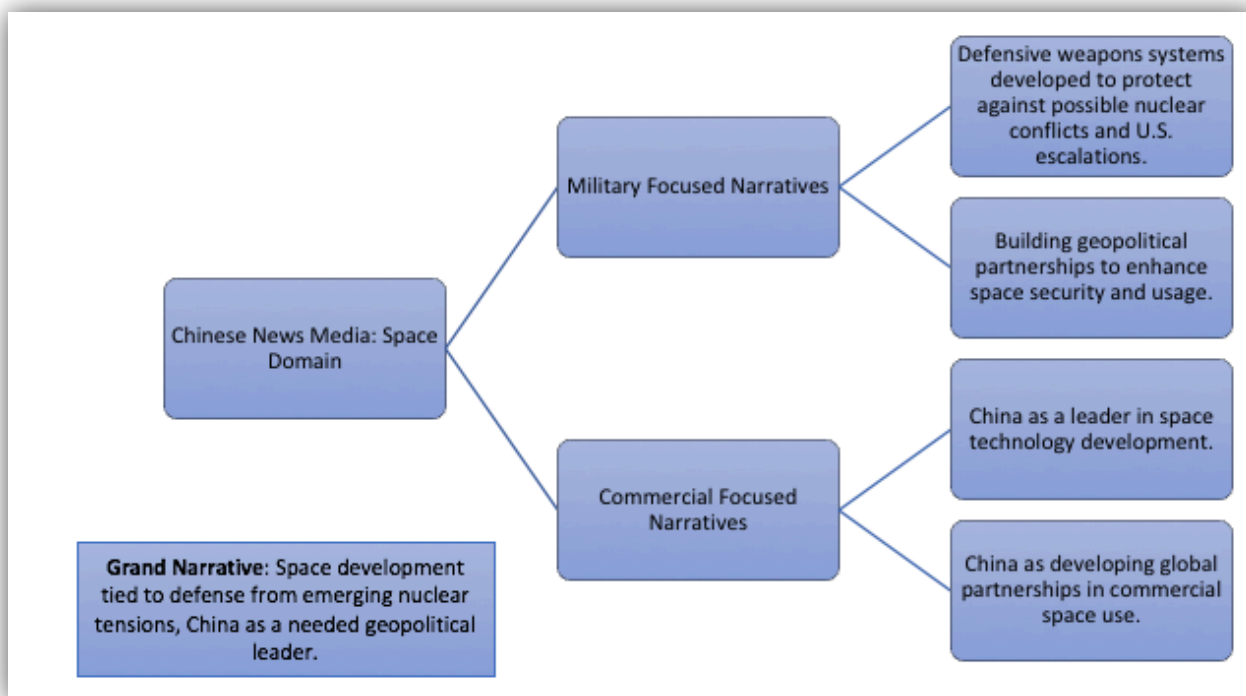
Educational initiatives, urban developments for space service cities in the east of the country, exploration projects of the moon and Mars are presented as critical investments the Russian government is making towards bettering the lives of its citizens in the future. Space services, including launch services and Glonass satellite services, are focal points of current Russian leadership and used to indicate that further Russian investment in space exploration, science, and technology will be profitable in the future; further Russia itself is shown as developing toward a space service provider for the entire globe. As nations wish to venture into space, Russia is shown as positioning itself to be the nation that will facilitate those journeys.

Regarding the militarization of outer space, the United States is heavily blamed by Russian media as instigating an arms race and weaponizing outer space by the following actions: placing weapons in outer space, developing global missile defense shields, providing satellite and guidance technologies to

terror groups, altering nuclear strike policies, and potentially creating a “Space Force.” The Russian government is presented as attempting to rationally, and asymmetrically respond to these U.S. led threats by: developing new, cost effective and technologically superior, weapons (such as missiles that can avoid U.S. systems, laser weapons to jam satellites, and weapons with hypersonic speeds), advocate for and sign arms reduction treaties related to outer space (specifically with China), as well as abiding within the parameters of current space arms treaties and norms (while the U.S. is shown as repeatedly violating these treaties and norms). **The U.S. is presented as an extremely dangerous actor related to militarizing outer space and is shown as particularly aggressive toward Russia; wishing both to neutralize Russia militarily and economically. Russia is shown as a victim of U.S. policies being forced into an armament race, while the U.S. is attempting to militarize outer space.**

The U.S. strike in Syria in particularly led to conversations in Russian media on nuclear war potentials and the instability of U.S. decision-makers, but also showed the Russian president as giving clear warnings that Russia would be willing to respond to U.S. actions in ways that would intentionally destabilize the global order using advanced weaponry.

Chinese Narratives and Overall Findings:



Overall, the Chinese news media present the People’s Republic of China as wanting to develop and maintain geopolitical partnerships (primarily with other BRICS nations) pertaining to outer space network systems and technologies. While the Chinese news media do present economic incentives for commercializing space toward Chinese interests, the overwhelming majority of news stories are concerned principally with the militarization of outer space. **Chinese news media show the U.S. as the**

leading instigator in space militarization, and consistently advocate for geopolitical cooperation in maintaining the peaceful use of outer space.

Regarding the commercialization of outer space, the main Chinese news media narratives were focused on: 1) China's global leadership role in space innovations and developments (i.e., repeatedly claimed China will soon become the world's leader in the commercial space industry), 2) potential future geopolitical partnerships to enhance China's commercial uses of outer space (e.g., *Russia, the U.N., G-20 nations, and other BRICS nations*), 3) specific developments of Chinese space technologies for commercial purposes (e.g., the planned orbital trajectory launch of the Chinese Space Station, China's developments in lithium ion batteries for use in outer space, future manned-spacecraft launches, and future deep space exploration missions), and 4) lists of economic incentives (e.g., the creation of jobs in China, the growth of artificial intelligence technologies, and the development of the Chinese space tourism industry), as well as many incentives for the environment (e.g., combatting and reducing the global effects of climate change) that stimulate and further reiterate the need for China to continue commercializing outer space.

Regarding the militarization of outer space, the main Chinese news media narratives were focused on: 1) China's national security incentives for militarizing space by developing defense systems to protect China against future nuclear warfare (i.e., numerous stories predict an international "space war" will occur within the next five years), 2) geopolitical tensions between the U.S. and other nations (e.g., North Korea, Iran, and Russia) in which several stories assert that the U.S. is the primary instigator and cause of these conflicts, 3) potential geopolitical partnerships to enhance China's military uses of outer space (e.g., *Russia and other BRICS nations*), 4) specific developments of Chinese space technologies for military purposes (e.g., anti-missile defense satellites and space laser capabilities), and 5) various military/national security incentives for China to continue with the developments of defensive outer space capabilities in order to defend China against future attacks and hostile threats.

Regarding the additional news stories from the month of April, the main Chinese news media narratives were focused on: 1) the potential for future nuclear warfare as a result of the U.S. conflicts with North Korea and Syria, 2) the future of trade relations between China and the U.S. (i.e., many news stories were very critical of the Trump administration's trade restrictions against China, which several news stories claimed are designed to weaken the Chinese tech industry), 3) negative presentations of the U.S. as a rather reckless bully among the international community (i.e., many news stories compared Trump's "Space Force" to Reagan's "Star Wars" and claimed it will inevitably fail), and 4) negative presentations of Western (especially the U.S.) news media coverage of China's prototype space station being destroyed upon reentry into the earth's atmosphere (i.e., a few news stories claimed the Western news media coverage has exaggerated this incident primarily out of fear and paranoia regarding China's technological developments and advancements in outer space).

Strategic Perspective:

While both Chinese and Russian news media present the U.S. as the most dangerous, aggressive and disruptive actor in relation to the space domain, these news media also both present to their populations that their governments are willing and wanting to cooperate in demilitarizing the space domain and that space development is an area of acute interest. Furthermore, **presenting the United States as fearful of other nation's developments related to the space domain, as desperate to**

preserve a system with itself atop the global order, and as non-cooperative are critical components to justifying their own actions in the space domain.

For Russia in particular, these presentations of the U.S. aid in justifying weapons developments and aggressive rhetoric. For China, such presentations of the U.S. allows justification for building and strengthening coalitions with other nations to develop the space domain, while also bolstering China's geo-political posturing related to outer space. Though these presentations of the U.S. are rather damning at face value, they nevertheless **create expectations and understandings among these populations that the U.S. is aggressive and reluctant to cooperate in relation to space domain activity** and that the governments of Russia and China are willing to do so. **Such expectations of these populations could potentially be capitalized on by directly countering these narratives and thus obliging cooperation** from the respective national governments in relation to space domain activity.

Project Description and Methodology

The following information summarizes the findings of four separate reports provided to the SMA group concerning Russian news media presentations of space related activity, as well as three separate reports concerning Chinese news media presentations of space related activity. All individual reports are provided in the appendix, access to all of the data pulled and processed for this report can be made available upon request to the authors. The Russian data analyzed includes news articles, news broadcasts and press releases from 2014 to 2018 concerning Russian activity and intentions in the space domain. Additionally, the Chinese data analyzed includes news articles and news broadcasts from 2017 to 2018 concerning Chinese activity and intentions in the space domain.

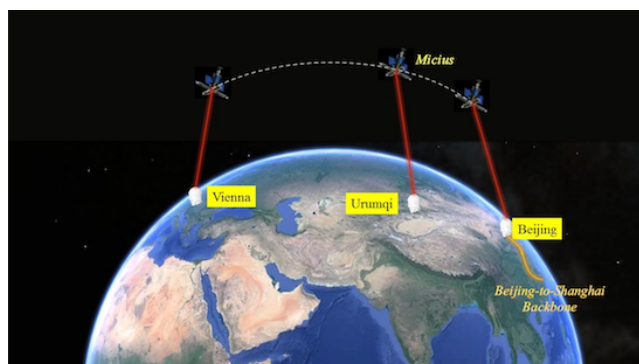
A quantitative content analysis and qualitative thematic analysis was conducted on all data, as well as a narrative analysis following Fisher's *narrative paradigm* (see Fisher, 1984, 1985a, 1985b, 1987, 1989, 1994), adapted to fit Miskimmon's *strategic narrative* framework (see Miskimmon, O'Loughlin, & Roselle, 2014, 2015, 2016, 2017). Chinese and Russian news articles and news broadcasts were collected using the Multi-Media Monitoring (M3S) system housed at Texas A&M University (M3S, 2018). The M3S system aggregates content from selected news outlets, providing the original format of the news item, along with source language and English translated transcripts of the original news item. Additionally, a number of press releases were pulled from official Russian websites. The coding scheme (see appendix) for the content analysis was developed by researchers to address the questions posed by the SMA group from a media-centric perspective. Meaning, the goal was to give insight into how the various questions posed by the SMA were being represented, and answered, in both Chinese and Russian news media; rather than attempting to provide fact-based answers to those questions from the information presented in news. Our project deals solely with news media presentations of items and events, it does not make an attempt to demonstrate an objective reality.

Russian Data Collection Overview:

A total of 975 news articles, news broadcasts and press releases were harvested using M3S from 16 separate Russian news sites; see appendix (including pro-government, stated neutral, and stated

oppositional sites), as well as the official Kremlin website and official Roscosmos website. Of those 975 news articles and press releases, 300 articles were quantitatively and qualitatively analyzed in relation to eleven separate questions in response to the SMA project call. An additional 50 articles coded and qualitatively analyzed from the month of April; due to the intense nature of discussions on the potential for nuclear warfare erupting, the researchers decided to add in the additional data to this report.

The bulk of the analyzed data, 94.3% (n=330) were news articles (n=306) and Kremlin press releases (n=24) related to Russian space activities between the dates of January 1, 2017 to April 17, 2018. The remaining 5.7% (n=20) were Kremlin and Roscosmos press releases related to Russian space activities between the dates of January 10, 2014 to November 23, 2016. The data preceding 2017 was collected and analyzed in order to help contextualize researchers to historic Russian space activity prior to the timeline outlined for the SMA project.



For the content analysis portion of the project, three coders (one of whom is a Russian language speaker) trained on the coding scheme, coding 15 articles independently on two separate occasions (n=30). Coders analyzed the data for the presence (1) or absence (0) of constructs addressing the SMA provided questions mentioned in news media. The final inter-coder reliability between coders was: Overall (K=.85), Peace, Crisis, & Conflict Norms (K=.86), Deterrence, Policy, Strategy & Signaling (K=.83), Service Protection Measures (K=.87). Following training in the content analysis code book, coders worked together to create consistent qualitative summaries of each of the inter-coded articles. The qualitative analysis included a thematic summary of each article, as well as a summary of best practices toward space law and leadership norms. Finally, following the quantitative and qualitative analyses, coders discussed and made note of narrative themes from the data in terms of strategic regional, national, and international narratives.

Chinese Data Collection Overview:

A total of 772 news articles and news broadcasts were harvested using M3S from 16 Chinese news sources (i.e., 15 online news sites and 1 broadcast TV news outlet). Of those 772 news stories, 301 news stories (i.e., approximately 39%) were quantitatively and qualitatively analyzed in relation to eleven separate questions in response to the SMA project call. Akin to the Russian data, due to the intense nature of discussions on the potential for nuclear warfare erupting, the researchers coded and qualitatively analyzed 50 additional online news stories from the Chinese news sources for the month of April. The majority of the analyzed Chinese data were online news articles (i.e., 88.7%; n=267) and TV news broadcasts (i.e., 11.3%; n=34) related to Chinese space activities between the dates of September 1, 2017 to April 17, 2018.

For the content analysis portion of the project, two coders (for one of whom Mandarin-Chinese is a first language) trained on the coding scheme, coding 50 articles independently on two separate occasions (n=100). The final inter-coder reliability between coders was: Peace, Crisis, & Conflict Norms (K=.82); Deterrence, Policy, Strategy, & Signaling (K=.83); Service Protection Measures (K=.83); and Space Law & Leadership Norms (K=.84). Thus, the overall inter-coder reliability between the two coders was approximately .83 (or 83%).

Following training in the content analysis code book, the coders worked together to create consistent qualitative summaries of each of the inter-coded articles. The qualitative analysis included a thematic summary of each article, as well as a summary of best practices toward space law and leadership norms. Lastly, following the quantitative and qualitative analyses, the two coders discussed and made note of narrative themes from the data in terms of strategic regional, national, and international narratives.

Russian Media Quantitative Results

Peace, Crisis, & Conflict Norms	Occurrence	Percent of Total
Approach to Ops & Services	n=166	55%
Military Conceptions	n= 144	48%
Commercial Conceptions	n=57	19%
Commercial Security	n=10	3%

Russian news media featured approaches to space operations and services most prominently, often discussing in detail space launching and missile capabilities in great detail. Military conceptions related to the space domain were mentioned in almost half of the articles analyzed, most often related to weapons developments and deployments. Commercial conceptions mentioned largely addressed regional (as in urban centers emerging in the east of Russia), scientific and educational developments predicted to result from Russia's investment into space operations and services.

Deterrence, Policy, Strategy, Signaling	Occurrence	Percent of Total
Operation Insight	n=86	28%
Space Markets	n=54	18%
Responses to Aggression	n=53	18%
Industry/Military Warfare	n=42	14%
Government Support	n=36	12%
Instability Contested Use	n=26	9%
Outside Resources Used	n=21	7%
Conflict Contested Use	n=21	7%
Peace Contested Use	n=18	6%
Commercial Threats	n=12	4%

Russian news media operational insight included details on where various space and missile systems were being deployed, how they could be used, and the innovation, planning and technology

required for their development. The space markets mentioned included providing the Glonass services and launch services to other nations, scientific developments in space related to better medicines and treatments, along with the science and space sector bringing businesses to Russia, while simultaneously educating a young generation on science and entrepreneurship. Responses to aggression and military-like warfare were largely mentioned in relation to the U.S. concerning nuclear policies and the U.S. missile defense system. Government is presented as highly supportive of the space sector. Contested use is largely in relation to military responses and developments in relation to the actions of the U.S. (no other actor is presented in relation to contested use).

Service Protection Measures	Occurrence	Percent of Total
Space Uses	n=68	23%
Actor of Greatest Risk	n=41	14%
How to Mitigate Risk	n=18	6%
Industry Partnership	N/A	N/A

Russian space uses and how the nation will tap into the growing space markets, as well as their commercial and industry goals relating to target numbers for launches, projects on the moon and on Mars are mentioned in Russian news media regularly. The United States is presented as the greatest risk actor in outer space; the U.S. is specifically accused by Russian media of weaponizing outer space. Mitigating risk, though not often mentioned, is important to be stated in this report. Risk mitigation is discussed almost exclusively in relation to arms treaties with the United States concerning the placement of weapons in space. Industry partnership and support is always mentioned as a long-term process and was removed from the coding scheme due to there being no presentation of short or midterm partnerships with specific industry.

A Factorial ANOVA (F-test) was conducted between the three different classifications of news sites (pro-government, stated neutral, and stated oppositional) to examine whether there were differences between the coverage of the coded space related items across source classification. Pro-government sources were the largest classification sampled (n=229), followed by stated neutral classification (n=53), and stated oppositional (n=18). **There were no significant differences between any of the news site classifications on any of the coded constructs related to outer space.** While this does not mean that the tone or intentions of the articles were the same across these classifications, it does mean that, by and large, the sites referred to the same items related to space with very little variance between them.

Chinese Media Quantitative Results

Peace, Crisis, & Conflict Norms	Occurrence	Percent of Total
Approach to Ops & Services	n=107	43%
Military Conceptions	n= 118	47%
Commercial Conceptions	n=44	18%
Commercial Security	n=14	6%

Chinese news media featured military conceptions related to the space domain most prominently, most often discussing China's need to develop weapons and anti-missile systems for national security purposes. Approaches to space operations and services most often discussed technological advancements in space launching and missile capabilities. Commercial conceptions mentioned largely addressed China's technological developments and collaborative efforts primarily in deep space exploration missions.

Deterrence, Policy, Strategy, Signaling	Occurrence	Percent of Total
Operation Insight	n=73	29%
Space Markets	n=61	24%
Responses to Aggression	n=67	27%
Industry/Military Warfare	n=22	9%
Government Support	n=56	22%
Instability Contested Use	n=22	9%
Outside Resources Used	n=26	10%
Conflict Contested Use	n=16	6%
Peace Contested Use	n=11	4%
Commercial Threats	n=7	3%

Chinese news media operational insight included discussions regarding various commercial and military technological developments in space. The space markets mentioned included discussions of the potential jobs that will be created, deep space exploration missions, and measures to combat the problems created as a result of climate change. Responses to aggression and military-like warfare were largely mentioned in the context of global nuclear warfare (e.g., the U.S. and the Korean peninsula). The Chinese government is presented as deeply invested in the space industry. Contested use is largely mentioned in discussions of the U.S. military and diplomatic actions.

Service Protection Measures	Occurrence	Percent of Total
Space Uses	n=61	24%
Actor of Greatest Risk	n=49	20%
How to Mitigate Risk	n=25	10%
Industry Partnership	n=14	6%

For Chinese space uses, the Chinese news media frequently discussed space developments as matters of national security, how China will take advantage of various commercial space markets, and deep space exploration missions. Although most of the stories were largely focused on the risks to China, the nations that were most frequently mentioned were: the U.S., Russia, Japan, North Korea, and India. For mitigating risk, many stories claimed that there is a major need for more commercial and military cooperation in the geopolitical context in order to uphold the peaceful use of outer space. Industry partnership is largely mentioned as a long-term process, but a few stories mention the short-term processes with other nations (e.g., Russia).

A Factorial ANOVA (F-test) was conducted between the three different classifications of news sites (pro-government, stated neutral, and stated oppositional) to examine whether there were differences

between the coverage of the coded space related items across source classification. Pro-government sources were the largest classification sampled (n=171), followed by stated neutral classification (n=45), and stated oppositional (n=35). There were statistically significant differences for seven categories.

For commercial conception, the oppositional sources differed from the pro-government and neutral sources (F=10.621, p=.000). For instability contested use, the oppositional sources differed from the neutral sources (F=3.172, p=.044). For outside resources, the oppositional sources differed from the pro-government and neutral sources (F=10.759, p=.000). For space markets, the oppositional sources differed from the pro-government and neutral sources (F=6.939, p=.001). For commercial threats, the oppositional sources differed from the neutral sources (F=4.085, p=.018). For government support, the oppositional sources differed from the neutral sources (F=3.096, p=.047). Lastly, for mitigating risk, the pro-government sources differed from the neutral and oppositional sources (F=7.439, p=.001). Across these categories, the primary reason for which the oppositional sources were significantly different is due to an extensive focus on issues pertaining to the Chinese military.

Russian Media Qualitative Results

Commercial:

Russian news media and Kremlin press releases present the commercial aspect of outer space as part of Russia's historical past and source of national pride, and as an important point of investment and emphasis for its future. The historic Russian leadership in space exploration and pioneering of satellite and space craft technology is juxtaposed to Russia's current initiatives to invest in educational programs, urban development programs in regions dedicated to servicing Russian space launch facilities, and Russia's commitment to be a leader in all areas related to outer space. Launch services and Glonass are the primary two items discussed in relationship to Russia currently leading the world in commercial space services. However, future plans of leadership are focused on as being a necessity to Russia. **Outer space commerce is shown as the industry of the future, and Russian media presents the nation as, not only currently being a leader in outer space, but investing significantly in the fruits that outer space exploration will one day bring.** The general notion across the news sites is that the state wishes to pave the way for young Russian scientists to have access to the best capabilities possible in order to eventually contribute to the emerging space industries (medicine, mining, exploration, tourism, etc...). Beyond just exploiting potential markets as they emerge in outer space, the investment is seen in a developmental light. Not only will areas that have launch services become futuristic cities bringing in great minds from all over the world, Russia itself will literally be the nation that others turn to when they wish to venture out into the stars. Rather than being space prospectors in various industries, Russian media presents the vision of Russian led outer space as a service provider of engineers, scientists, and capabilities that others will reach out to for their various space related initiatives.

Military:

Russian news media and Kremlin press releases present the military aspect of outer space as a critical counter balance to U.S. led weaponizing of space. The principle argument is that the United States has forgone ballistic treaties and normative uses in the space domain in order to expand and maintain its dominance in the current global order. Russian reactions to U.S. activity is to respond asymmetrically (in

that it will not engage in a cost prohibitive escalation of arms in space). **Russia's asymmetric response is to develop weapon systems that can defeat U.S. and NATO led missile defense shields to maintain nuclear sovereignty, while also warning that U.S. actions of placing weapons in outer space necessarily causes other states to respond with technologies capable of defeating such weapon systems.** The U.S. led strikes in Syria, and surrounding tensions, allowed Russian media to claim its missile defense systems were being effectively deployed to neutralize U.S. armaments. More importantly U.S. actions in Syria led to serious concern and discussions of potential nuclear conflict and escalations, which would force Russia into using weaponry that would destabilize the global order should the U.S. continue its aggressive behavior.

Chinese Media Qualitative Results

Commercial:

The Chinese news media present the commercial aspect of outer space as a major source of establishing future geopolitical partnerships. In particular, China views Russia and other BRICS nations as key potential partners in the commercial space industry in the future. Moreover, the Chinese news media frequently claim China's developments and efforts in outer space are on an upward trajectory. The Chinese news stories frequently claim that China will soon surpass the United States as the world's leader in the outer space industry. Furthermore, many Chinese news stories claim the development of space markets (e.g., commercial space flights, the space tourism industry, and space-flight exploration missions to Mars) will be particularly beneficial to China in the future. Thus, the recurring theme is that China is very optimistic and eager to invest more heavily in the space industry.

Military:

The Chinese news media present the military aspect of outer space as a critical to national security to prevent future attacks against China. While the Chinese news stories discuss various nations, the recurring narrative is that China has become forced to develop and enhance its military's space technologies as a result of the West's (particularly, the United States') efforts to militarize outer space. China's response to the U.S. militarization of space is to develop anti-weapons systems that can withstand future attacks. Furthermore, several news stories reiterate that China is working with various nations (e.g., Russia and other BRICS nations) to develop geopolitical partnerships in order to uphold the peaceful use of outer space.



Russian Strategic Narratives

Issue:

Russian news media narratives focused on the Trump proposed Space Force, U.S. nuclear policy, U.S. escalations of potential nuclear conflict with attacks in Syria, and U.S. defense systems in an attempt to contrast Russian moderation toward the space domain. The primary answer to these issues, according to Russian news media presentations, was the development and presentation of weapons capable of

countering U.S. developments terrestrially and weaponizing of outer space, as well as giving the U.S. clear warnings of assured Russian retaliation. **The issue related narratives present Russia as a reasonable actor attempting to build its space industry for science and exploration, while countering the hostile actions of the United States.** Russian concerns of nuclear escalation by the U.S. in relation to Syria are discussed at length, as are potential responses.

National:

Russian news media presents outer space as a national interest and imperative to further the economy, build a youthful generation of scientists, and further science. Perhaps more importantly the national narratives stress the importance of developing the space sector for Russians as a sort of pseudo replacement of economic gains in the present, space related narratives offer a future of prosperous success for the youth of Russia (with the government heavily invested in space related development). The exploration of outer space and the funding provided by the Russian government is presented as a developmental necessity, and historical imperative, that will ultimately result in Russian economic success in a yet to be determined future. Of note, oppositional sites bemoan the costs, and failures, of Russian related space activity and see it as a sincere waste of resources given problems of corruption and state mismanagement. **These narratives rely on historic Russian space exploration and success as justification for investing in space and building the Russian economy around space related initiatives; space exploration and development is presented as a point of national pride. Space related weapons programs are shown as defensive and necessary to maintain Russian sovereignty.** The weapons themselves are presented as representing the best in technological development, again, used as a source of pride.

International:

Perhaps most important to the discussion of narratives, Russian news media presents the international system as entirely run and organized by a militaristic United States. Russia is shown as a logical counter actor to U.S. led aggression in space, as evidenced by relations and treaties with China and other nations agreeing to not place weapons in outer space. Russian military advancements are presented as a necessary response to U.S. developments, and, more sinisterly, cast the U.S. as an oppositional force attempting to lure Russia into an arms race. The U.S. is shown as intentionally wishing to wage economic war against Russia and building weapons that may ultimately lead to a full-on conflict with other nations. Russian international narratives attempt to present the nation as having a sane, economically viable, and moderate response to U.S. and NATO led aggression (particularly against a global missile defense shield and U.S. nuclear policies), further Russia is shown as an actor seeking peace and promoting international arms treaties in the face of such aggression. Even the nuclear weapon display during Putin's Federal Assembly speech are casts as responses to U.S. provocations (though oppositional sites fear such escalation as a sign of Russian state collapse). **Russian strength and moderation, its abidance of existing international treaties and norms, as well as intelligent caution and asymmetrical responses, in its dealings with hostile international actors are the principle projections from the international Russian narratives presented in news media.** In Russian news media discussions in relation to U.S. strikes in Syria and potential further action by the U.S., clear warnings are given that the Russian government would be willing to risk global order instability rather than absorbing further aggression by the U.S.

Chinese Strategic Narratives

Issue:

Chinese news media narratives focused on the importance of space development and innovation to China's wellbeing in future economic, military, and national security matters. Overall, the main narratives focused on: China's development of space technologies and global leadership in space, geopolitical tensions between the U.S. and other nations (e.g., North Korea, Iran, and Russia), potential geopolitical partnerships to enhance China's commercial and military uses of outer space (e.g., *Russia, the U.N., and BRICS nations*), the economic incentives for China in commercializing space, and the national security incentives for militarizing space by developing defense systems to protect China against future nuclear warfare. **These narratives indicate that the Chinese news media are concerned about the militarization of outer space and that China is eager to establish geopolitical relations in order to uphold the peaceful use of outer space.**

National:

Chinese news media presented the development in outer space technologies as vitally important to China's national interests in the future. According to the Chinese news media, the primary reason for these space developments is to safeguard against future potential attacks from global aggressors. Another key reason for these space developments, according to the Chinese news media, there is unlimited potential for economic developments as a result of future outer space technological innovation.

Ultimately, these narratives indicate that the Chinese news media are optimistic about the future economic incentives pertaining to the development of outer space technologies and collaborative efforts with commercial space entities regarding deep space exploration missions.

International:

The most commonly recurring narrative among the Chinese news media is China's need to uphold the peaceful use of outer space as a result of the militarization of outer space by the United States. The Chinese news media frequently discuss establishing geopolitical partnerships with various nations (primarily with Russia) regarding future developments in outer space technologies and networking systems. **These narratives indicate that the Chinese news media present the U.S. as the primary aggressor in the militarization of outer space, and the Chinese news media believe the best ways to counter this space militarization is to develop geopolitical relations (e.g., Russia and other BRICS nations) to prevent future space militarization.**

Concluding Remarks

Russian and Chinese news media present the space domain as an integral part of development and national, as well as international, security. The Russian news media present the space domain as a critical part of the nation's economic plan going forward. Relying on a long history of space leadership, launch capabilities, and Russian pioneering spirit, the Russian state is shown as heavily invested in commercial developments of the space domain and claim such developments will be Russia's economic path forward; bringing in scientists and developing the eastern regions of the nation. It must be noted that these developments and economic prognoses of Russia's commitment to the space domain occur during a time of economic stagnation within the Russian Federation. The Russian media's presentation of Russia's

defense systems and space domain influencing military capabilities are virtually always mentioned in relationship to the United States, and it must be also noted that the deterioration in relations between the U.S. and Russia has no doubt added to the hostile tone in which Russian media present military capabilities in the space domain. The result is that much of the Russian news media's conversation concerning the space domain is a demonstration of state strength projection and economic promise.

Overall, the Chinese news media present outer space as a vital component in China's future economic, military, and national security plans. Regarding the commercialization of space, the Chinese government is presented as heavily invested in, and rather optimistic about, commercial space developments and its impact on the Chinese economy in the future. Especially following recent conflicts regarding trade relations between the U.S. and China, much of the Chinese news media narratives present the U.S. in a negative manner and, simultaneously, call for China to establish geopolitical partnerships with various nations (e.g., Russia, the U.N., the G-20 nations, and other BRICS nations) in the commercial and military space domain. Regarding the militarization of space, the most recurring narrative among the Chinese news media reiterates the need for China to work with other nations (e.g., Russia, the U.N., the G-20 nations, and other BRICS nations) to uphold the peaceful use of outer space. This media narrative is particularly evident in stories discussing the need for China to safeguard against future nuclear warfare in outer space. Moreover, several Chinese news media stories claim the U.S. is the primary instigator behind the likelihood of these "space wars" occurring in the future. Thus, much of the Chinese news media's discussions of outer space is motivated by the potential for economic prosperity, enhanced international relations, and advancements in national defense capabilities.

It is the hope of these researchers that the narratives uncovered here related to the commitment of these nations to outer space development and the use of presentations of an aggressive U.S. to justify weapons development, defensive posturing, and geo-political partnerships with nations other than the U.S. to develop the space domain can be capitalized upon by strategically crafted and disseminated counter-narratives and intentions related to the space domain.

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Appendix 1. SMA Issued Reports

Russian Report- September Data Pull:

This report includes data pulled from the Kremlin website, the majority of which were press releases and news reports. A few of these were interview with President Putin. Timeframe spans from 2014-2017, the large majority of these releases come between 2016-2017. Key terms used: “Outer Space” “Space” & “Roscosmos”, duplications and irrelevant stories removed.

Ultimately, Russia sees itself as a leader in outer space, they want to continue that leadership and develop a strong space sector to bolster their economy, infrastructure, and develop youth. Russia does not present space a military area often, instead they present it as a market-place in which they are heavily invested and awaiting increasingly greater ROIs.

1. How does each entity in the following categories conceive of space operations for military and commercial purposes? How do they approach space operations and services? Is there any difference in how their commercial ventures (if any) consider security during peace, crisis and conflict?
 - a. Military- 11 out of 43 stories reference military conceptions: Largely these stories focus on developing civilian technology for dual military purposes, GPS system GLONASS and satellite orbitals and other new technologies important for defense are mentioned are being developed. Critically, all of these are referenced as defensive weapons and Russia sees themselves as being pushed into militarization by the West.
 - b. Commercial- Russia sees itself as a leader in space, the leader in space. Every possible market that can be mentioned is mentioned for development. Russia sees the space sector as a way for it to grow its economy, modernize, further international respect, develop parts of the country that are in the Far East, and retain its brightest youth. This is mentioned in 27 of the articles. Critically, the state is heavily invested in all space markets development and sees it as the future, expects large ROIs.
 - c. Approaches- Huge state investments with expectation of large ROIs, infrastructure development, and retention of brightest youth. Willing to partner with almost any nation that needs its space services (especially launch services and GLONASS system use).
2. What are the motivations of nation-state and non-state actors (e.g., violent extremists, etc.) to contest use of space in times of peace, instability, and conflict?
 - a. Conflict is never mentioned.
 - b. Instability motives for contesting use is mentioned on only two occasions: Russia believe political tensions should not affect business of space and international business cooperation in the space sector. Russia mentions taking counter-measures to balance moves taking by the West.
 - c. Peace motives for contested use: Interference in Russian market share of space sector, this is considered industry warfare not military. Disruption to space access would not be tolerated by Russia. Threats to environment and systems would be issues from Russian perspective. However, it should be noted Russia sees space primarily as a business/industry area, not a military to protect.
3. What insight can the US/partners obtain from the space-based information service approaches used by international actors that lack their own space capabilities?
 - a. Russia is willing to invest extremely heavily in the space industry, in all sector.... including technologies that they have yet to master....willing to nationalize the industry if needed, privatize portions of it if needed, and put itself in debt in order to capitalize on the future technologies and exploration potentials offered from space development.
4. How are the components of the commercial space industry allocated outside of the U.S.? Which countries have which types of market interests on the commercial end (e.g. tourism, imagery, navigation etc.)?
 - a. There is literally no portion of the space market that the Russians do not want to develop. Their most important areas are launch services, engine rockets, GPS services, and new technologies related to rockets and crafts. However, missions to Mars, bio-techs, planetary monitoring systems, growing “space” cities of scientists are all mentioned. Partnerships with other nations to utilize Russian services is also very important to them.

5. How do commercial ventures think about the security of their space assets during peacetime, crisis and conflict? Do industry leaders think about warfare in or through space differently than military leaders? What are their main concerns? How reliant are they on governments for warning or protection of space? What are their threat priorities?
 - a. Commercial security threats- political tensions with the West, corrupt contractors and young nations with emerging space market interests.
 - b. Industry vs. Military warfare- While there is concern that space is becoming an extension of military war space, by and large Russia sees space as a commercial area of business and economic “war.”
 - c. Industry Reliance of Govt Protection/Support- The space industry in Russia is extremely reliant on government support, this is sometimes a cause of frustration as leadership does not believe Russian companies have been as competitive internationally as they should be given the investments the state has put forward. A patient but pressing want for ROI is present.
6. What are the principles (e.g., flexible v. controlled response; proportionality, etc.) upon which international policy makers should develop response options for aggression in space?
 - a. Response to Aggression- Russia views space as a business, regardless of political climate they are open for business. Russia views all military actions they have taken in space as forced response from Western aggressive positioning in space. Counter-measures.
7. Reducing Risk
 - a. More business cooperation, reduction of NATO, cooperation on defense capabilities, stop defensive arms race, cooperate on space services, reduce politics in space.

Russian Report – October 2017 Data Pull

This report includes news reports from 9 Russian news sources pulled from October 2017. The key term used: “Space”, duplications and irrelevant stories were removed. A total of 350 unique stories were pulled for this report.

Overall: Main narratives focus on development of Russian technologies and Russian leadership in space sector; tensions with the United States over military exercises, sanctions, U.S. lack of data share and proper communication, and potential U.S. misunderstandings/interference with North Korean space development pursuits; cooperative programs on lunar projects and Mars exploration.

News across Russian media highlighted the importance of space development to the future of Russia, notes heavy state investment of funds for 2018 into the space sector and development of Russian technologies. Coverage of development of technologies related to maintaining space equipment, moving objects into outer space more efficiently, technologies capable of assessing the composition and capabilities of weapons and satellites launched into orbit by other nations, climate and atmosphere composition monitoring, and nuclear power reactors for space craft. Cooperative corporate and state efforts in development lunar stations and Mars exploration mentioned in relation to U.S. enterprises with Russia.

*Focus on tensions with the United States related to nuclear force exercises without proper notification, U.S. lack of cooperation in information sharing related to dangerous interstellar space objects, difficulties in working with the U.S. and U.S. companies because of sanctions (particularly the export of titanium for space craft development and threat of Russian reduction of supply of material components to Boeing). Coverage of U.S. missile defensive systems presents these systems as a threat to international space development. North Korean space developments presented as rightful to their national sovereignty, with fear of misunderstandings with U.S. over such developments leading to conflict. **U.S. government presented as a dangerous non-cooperative actor in outer space.***

1. How does each entity in the following categories conceive of space operations for military and commercial purposes? How do they approach space operations and services? Is there any difference in how their commercial ventures (if any) consider security during peace, crisis and conflict?

- a. **Military-** News media focuses on U.S.-Russian tensions over sanctions, which are affecting space development cooperation between the two countries. U.S. missile defense systems presented as a threat to international space activities. Russia warns the U.S. against nuclear force exercises and increasingly military displays. Notes the U.S. is only concerned with defending itself. Caution of retaliatory measures to be taken against the US, such as suspension of flights of U.S. astronauts to ISS and the termination of supplies components to Boeing. Future wars mentioned as being waged in outer space.

North Korea space development is presented as inevitably increasing and the nation's right, though there is concern over potential increased ballistic testing. Russian history in space and military/aviation achievements are highlighted, celebrating Russian figures such as Korolev and his contributions to space and ballistic developments, mentions of Russian aviation as best in the world, highlights developments of ballistic vehicles by Roskosmos, surface to air missile agreement between Russian and Saudi Arabia mentioned. Russia presented as working with CIS nations to solve militarization of space concerns.

- b. **Commercial-** Mentions several companies proposing money making ventures in space station and space craft development, from American company developing inflatable capsules to jet propulsion groups developing satellites to Russian development of new technology for space equipment maintenance.

Russian space exports such as titanium are mentions as sources of wealth, one mention of Russia selling a space capsule to a French theme park. Russian Glonass satellite system seen as very important. Russian proposal to develop nuclear power plants in outer space is discussed in contrast to solar power proposals.

- c. **Approaches-** Russian investment in space sector and commitment to being a space industry leader both commercially and as a nation is the primary narrative in news concerning approaches. Discussions on developing an outer space nuclear power plant, search for lunar station sites, Russian corporation opening center for research and development of lunar exploration programs, and Russian investment in space sector totaling 182 billion rubles for 2018. Partnership with Saudi Arabia and importance of increasing commercial Russian space rocket launching capabilities is stressed.

Concern over ability to track interstellar objects entering our solar system, need for specifically the U.S. and its agencies to share intelligence on threatening objects, and increased partnership with U.S. is need for lunar developments. Competing with U.S. as space leader is an important theme particularly in relation to Mars exploration.

2. What are the motivations of nation-state and non-state actors (e.g., violent extremists, etc.) to contest use of space in times of peace, instability, and conflict?
- a. **Conflict for contested use:** N/A
- b. **Instability motives for contesting use:** Concern that North Korea, though is possess the right to explore space, will lead to further political and military tensions. Stresses N.K.'s freedom to pursue space programs, though ballistic testing will be a point of international contention.
- c. **Peace motives for contested use:** Coverage of international frustrations over U.S. unwillingness to share information regarding dangerous space objects. Unwillingness to share information could lead to growing international tensions between China, Russia, and the U.S. in space operations.

U.S. and Chinese space pollution and debris mentioned as a concern that could lead to international incidents.

3. What insight can the US/partners obtain from the space-based information service approaches used by international actors that lack their own space capabilities?
 - a. Heavy state investment for space exploration in 2018.
4. How are the components of the commercial space industry allocated outside of the U.S.? Which countries have which types of market interests on the commercial end (e.g. tourism, imagery, navigation etc.)?
 - a. Importance of Russian titanium exports for space industry to the Russian economy. Russian corporate development of optical, electronic, and radio systems for detecting and obtaining characteristics of space weapons and satellites during their launch flight through the atmosphere. Space theme parks mentioned in relation to Europe. Commercial aid in developing power plants and lunar stations/satellites.
5. How do commercial ventures think about the security of their space assets during peacetime, crisis and conflict? Do industry leaders think about warfare in or through space differently than military leaders? What are their main concerns? How reliant are they on governments for warning or protection of space? What are their threat priorities?
 - a. **Commercial security threats:** Space debris a threat to commercial interests, lack of information sharing related to threatening space objects mentioned as a concern.
 - b. **Industry vs. Military warfare:** North Korea space program leading to international conflict mentioned as concerning Russian government.
 - c. **Industry Reliance of Gov. Protection/Support:** Russian support for Russian corporations and investment in space development heavily mention. Protection of Russian space component markets to overall international spacecraft development.
6. What are the principles (e.g., flexible v. controlled response; proportionality, etc.) upon which international policy makers should develop response options for aggression in space?
 - a. **Response to Aggression:** Coverage of Russian Defense Ministry estimates that by 2022 the number of anti-missile systems of the US missile defense system will be more than 1,000 units, and in the future will exceed the number of combat units deployed on Russian intercontinental missiles.
7. What insight on current space operations can we gain from understanding the approaches used for surveillance, reconnaissance, navigation, communication, timing synchronization, and indications and warning before the advent of the space age?
 - a. **Insights into Operations:** Coverage of monitoring systems of change in Earth's atmosphere as related to climate change, Europe and Russia deploying this type of monitoring technology. Russia technology to monitor implementation of Start III treaty. Russia adapting new technology to make it easier to get component material into outer space. Development plans for lunar station coverage.
8. Are other nations outside the West poised to tap into their own commercial space industry for military purposes in the next 5-10 years?
 - a. **Own Commercial & Military Space Uses:** Russian technology for maintenance of materials in space, bringing items into space with greater ease, satellite technology to monitor ballistic launches and climate changes. Commercial developments of lunar stations, nuclear power. Importance of launches and raw materials for space craft development important to Russia.
9. Will major commercial space entities likely serve as disruptors or solid partners in terms of state national security interests? In the short term (5-10 years), mid-term (15-20 years) and long-term (25+ years)?
 - a. Short-Term: Solid partners*
 - b. Mid-Term: Solid partners*
 - c. Long-Term: Solid partners*

10. Which international actors currently have the greatest strategic risk in the space domain? What affordable non-space alternatives are there to mitigate or avoid that strategic risk?
 - a. **Actor Greatest Space Risk:** Lack of cooperation and intelligence sharing. Potential misunderstanding internationally over North Korean space development. U.S.-Russian tensions over sanctions. U.S. strategic nuclear force exercises.
 - b. **How to Mitigate Risk:** Maintain obligatory notices of actions related to nuclear forces. Recognition of N.K. sovereign rights to develop space program.
11. What can the US do to best facilitate development of verifiable norms that maintain a peaceful space domain?
 - a. **Best Practices for Norms & Peace:** Cooperative efforts in relation to lunar and Mars development plans. Reduction of missile defense systems related to outer space. Proper notification of force exercises. Educational platforms for students toward information sharing.

Russian Report – November 2017 to January 2018 Data Pull

Dates: 10-15-2017 to 1-15-2018

Key Terms: Outer Space, Deep Space

Total Articles Pulled: 314 from 9 Russian news sources

Total Articles Analyzed: 107

Overall, December and early January showed a stark shift in conversation relating to outer space in Russian media. Coverage on concern over U.S. and NATO actions in positioning military and technology systems, the proliferation of U.S. drone technology in Syria, the continued degradation of U.S.-Russian relations across a broad spectrum of items, and uncertainty over changes to U.S. nuclear strike policies led to an extensive amount of conversation concerning Russian technological capabilities of missile defense systems, risks of escalations in weaponizing of outer space, and terrestrial conflicts spilling over into the space domain. This is shift away from previous conversations on space exploration, scientific discovery, and commercial ventures relating to space seen earlier.

Russian media presents Russia as an actor interested only in defense and preventing a slide into the chaos of war, yet possessing highly capable systems should the need arise. U.S. presented as a highly destabilizing global actor in the space domain, seeking to use brute force for unilateral goals and refusing to recognize the multi-polar relations involved in the space domain. There was still some coverage of space and technology developments for commercial and scientific exploration purposes, including joint operation with U.S. and NASA; the lunar orbiting station and Luna-25 surface mapping project, as well as delivery and launch partnerships were mentioned.

1. How does each entity in the following categories conceive of space operations for military and commercial purposes? How do they approach space operations and services? Is there any difference in how their commercial ventures (if any) consider security during peace, crisis and conflict?
 - a. **Military-** Coverage of U.S. drone technology potentially in hands of Syrian rebels causing Russia apprehension about how to secure itself and what military technology and weapon measures are needed in space to control threat. Russia boasts of testing new missile system capable of beating U.S. space defense systems. Coverage of missiles and rockets supplied by Russian corporations to Russian defense systems, seen as a mark of competition and efficiency. Positioning of Russia as a global protector of international space norms, "
 - i. *"We defended the universal values of truth, justice, equal and mutually respectful cooperation, and also tried to prevent the degradation of the world order system, which is seriously unbalanced today. We would do anything to stop the slide toward chaos and confrontation"*

Growing concern that breakdowns in U.S. and Russian relations will lead to escalations in multiple domains. The degradation of measures of mutual military confidence, the violation of treaties, the arms race, the operations for the disintegration of troops and the population of a potential adversary, the war of intelligence and counterintelligence.

Announcements of 2018 tests of a promising heavy intercontinental ballistic missile. Russian defenses developing system of anti-satellite weapons, which will be able to block enemy communication satellites in space. NATO and U.S. shown as militarizing space and forcing Russia to develop weapons as a response.

- b. **Commercial-** Coverage of corporatization of Proton and Anagara rockets at Khrunichev completed in November 2017. Discussion on using satellite technologies to monitor changes in Earth's climate and the impacts of climate change. New satellite technology allowing 3D mapping of Earth discussed. Coverage of Luna-25 project, aimed at mapping the lunar surface for scientific discovery. General coverage of Russian commercial technology applications to military defense applications and the superiority of Russian space technologies.
 - c. **Approaches-** Russia presented as an actor stabilizing outer space and working towards global peace in space use. Russia as developing space technologies and weapons to prevent the threat of drones on infrastructure targets and to combat aggressive space technologies being deployed by U.S. and NATO.
 - i. Russia as developing technologies to prevent and block satellite communications. Mention of weapons related to new rocket motors designed for a short, very powerful boost stage so that American space-based infrared detection satellites have less time to detect and track.

Coverage of US and Germany satellites being launched from Russia with approval from the Russian Ministry of Defense to use for data collection of the automatic identification system for sea-going vessels. Scientific and exploratory approaches mentioned frequently.
2. What are the motivations of nation-state and non-state actors (e.g., violent extremists, etc.) to contest use of space in times of peace, instability, and conflict?
 - a. **Conflict for contested use:** Coverage on the discussed usage of the Russian Unified Space System during a potential conflict, as well as discussion on U.S. announcements of plans centered on using nuclear force following non-nuclear attacks. U.S. is shown as lagging behind in some key areas of technological development in comparison to Russia in areas of space defense.
 - b. **Instability motives for contesting use:** Serious concern over U.S. drone technologies and their proliferation as threats to Russian energy infrastructure. Proliferation seen as an escalation requiring Russia to develop better space weapons and technologies to combat potential threats; including communication blocking technology and capabilities to eliminate targets. New challenges from West risk an arms race in space; Russia presents itself as reluctant to engage in build-up but notes the need to respond to challenges of U.S. and NATO and to have weapons capable of neutralizing U.S. space superiority. Concern over growing discussion of nuclear options by the United States and needed defense measures.
 - c. **Peace motives for contested use:** Using space technology appropriately to gain an accurate, and free from political bias, information on climate change impacts.
 3. What insight can the US/partners obtain from the space-based information service approaches used by international actors that lack their own space capabilities? N/A
 4. How are the components of the commercial space industry allocated outside of the U.S.? Which countries have which types of market interests on the commercial end (e.g. tourism, imagery, navigation etc.)?
 - a. Coverage on launching of satellites for other nations and development of better rockets and heavy launch vehicles.
 5. How do commercial ventures think about the security of their space assets during peacetime, crisis and conflict? Do industry leaders think about warfare in or through space differently than military leaders? What are their

main concerns? How reliant are they on governments for warning or protection of space? What are their threat priorities?

- a. **Commercial security threats:** Proliferation of U.S. drone technology and satellite navigation capability seen as an open threat to Russian energy infrastructure and commercial areas. Some discussions on space debris and cleanup, and how the international community needs to come to a focused agreement concerning the threat of debris.
 - b. **Industry vs. Military warfare:** Much of the coverage focused on the potential for terrestrial conflicts and military posturing between the United States and NATO toward other nations as potentially escalating military warfare in the space domain.
 - c. **Industry Reliance of Gov. Protection/Support:** N/A
6. What are the principles (e.g., flexible v. controlled response; proportionality, etc.) upon which international policy makers should develop response options for aggression in space?
- a. **Response to Aggression:** Coverage showing Russia considers U.S. drone technology proliferation a security threat it must have technological capabilities to address. Russia presented as a peaceful actor attempting to bring balance to chaotic global order in relation to space operations. Russia shown as developing weapons capable of defeating U.S. space detection systems
7. What insight on current space operations can we gain from understanding the approaches used for surveillance, reconnaissance, navigation, communication, timing synchronization, and indications and warning before the advent of the space age?
- a. **Insights into Operations:** U.S. drone technology proliferation shown as leading to increases in security concerns and need for defensive weapons technology in space. "Death Star" type of ray technology mentioned in this regard. Uncertainty over Trump administration policies concerning space security a growing concern; Russian actions are presented as only defensive in nature. Coverage of Russia adapting new technology to make it easier to get component material into outer space; development plans for lunar orbiting station and Luna-25 project.
8. Are other nations outside the West poised to tap into their own commercial space industry for military purposes in the next 5-10 years?
- a. **Own Commercial & Military Space Uses:** N/A
9. Will major commercial space entities likely serve as disruptors or solid partners in terms of state national security interests? In the short term (5-10 years), mid-term (15-20 years) and long-term (25+ years)?
Russian media coverage presents commercial space entities as long term solid partners with the Russian state and its space development plans.
10. Which international actors currently have the greatest strategic risk in the space domain? What affordable non-space alternatives are there to mitigate or avoid that strategic risk?
- a. **Actor Greatest Space Risk:** U.S. and NATO accused of weaponizing outer space. U.S. shown as a destabilizing entity in space: proliferation of its drone technology, withdrawing from major global agreements that include monitoring climate change, U.S. an actor using brute force to accomplish its goals
 - i. *"Our American colleagues and their allies want to conduct business solely on the basis of dictates and ultimatums, do not want to listen to the views of other centers of world politics, thereby, in fact, do not want to recognize the reality of the emerging multipolar world. The methods they resort to deter their competitors are rather dubious and unfair, and their range is wide - from deploying a global missile defense system to unilateral sanctions, extraterritorial application of their own legislation and threats to solve any international problems solely in their scenario, without stopping before, including the use of brute military force."*
 Degradation of U.S. Russian relations seen as a very real concern in terms of global space security.

- b. **How to Mitigate Risk:** Coverage claims U.S. must limit its tactics in using brute force and military might in order to push through unilateral goals. Abandon impractical space missile programs, investment in space troops and related space forces to combat threat to stability of space use.
11. What can the US do to best facilitate development of verifiable norms that maintain a peaceful space domain?
- a. **Best Practices for Norms & Peace:** U.S. is called on to stop being a destabilizing agent and recognize the multi-polar order of the space domain.

Russian Report – March 2018 Data Pull

Dates: 3/01/2018-03/23/2018

Key Terms: Federal Assembly, Outer Space

Total Articles Pulled: 219 from 11 Russian news sources

Total Articles Analyzed: 78

Overall, this data centered on two primary events through the month of March. **The first event was President’s Putin’s Federal Assembly speech detailing new missile and nuclear weapon capabilities that are claimed to nullify U.S. defense systems. These weapons developments by Russia are explained as necessary, and more affordable, counter measures to the U.S. global missile defense system that Russia claims is designed to promote expansions of NATO and to reduce Russia’s ability to effectively engage militarily. Furthermore, though there are repeated claims by Putin in the articles that he does not seek an arms race, the previous U.S. withdraw from the anti-ballistic missile treaty up to the Trump administration’s harsh stance toward Russia in its released nuclear doctrine are cited as a continuing historic process of escalations by the U.S. toward Russia leading it to develop new weapons.** Great detail on the capabilities of these weapons is given in article after article, a public voting process to name the new weapons was held and reported on as well, and Russian administration officials were cited as claiming the new weapons did not violate any armament treaties. Russian officials are also cited as claiming the new weapons are solely for defense purposes, and Putin is covered detailing the conditions under which Russia would use nuclear force.

The second event was President Trump’s announcement on the possibility of creating a U.S. Space Force. This announcement is used by Russian media to further paint the U.S. as an aggressor in outer space, with claims that U.S. plans to militarize outer space go back at least to June of 2017. The Russian Duma is featured in articles where it is heavily critical of the U.S. and the proposed Space Force. Treaties between Russia and China agreeing not to place armaments in outer space are contrasted to the position of the U.S. in what is deemed “strategic blindness” by the Trump administration in its increased escalation and military rhetoric concerning the space domain. Trump is shown mockingly as praising himself for coming up with the Space Force phrasing and idea. The U.S. is presented as fearful of other nations that are developing space capacities, as intentionally limiting Russia’s ability to sell missile and launch equipment and attempting to militarize outer space for its own benefit.

There are also sporadic critiques of Putin’s sabre rattling, with suggestions that Putin is actually seeking an armament negotiating position with the United States concerning space weapon capabilities. Mentions of the failing economic situation in Russia are contrasted against Putin attempting to develop superweapons to bolster his domestic and international position, rather than attempting economic reform. One article notes it is a repeat of Soviet posturing that Putin is taking up to give Russians a sense of pride before the elections. Some stories reference international doubts as to whether Russia actually possess the weapons it claims to have given the launch failures and setbacks to military developments as a result of the economic conditions in the country. Finally, mentions of Russian planned missions to Mars and the Moon in 2019 for scientific discovery, and successful launch to ISS are the stories that close out the end of the data pull.

1. How does each entity in the following categories conceive of space operations for military and commercial purposes? How do they approach space operations and services? Is there any difference in how their commercial ventures (if any) consider security during peace, crisis and conflict?
 - a. **Military-** Russian weapons systems detailed at great length for the newly developed capabilities and capacity to defeat U.S. missile defense systems. The names of each weapon, and each weapon's capabilities, along with their novelty and effectiveness against all defenses is discussed in detail. The bulk of news coverage of the month concerned these weapons.
 - i. *"According to Putin, the new missile has an unlimited range and unpredictable flight trajectory. On the screens during the speech of the president was shown a video, where the missile bypasses the American missile defense system. 'Any use of nuclear weapons against Russia or its allies - small, medium, and any power - will be considered as a nuclear attack. The answer will be immediate and with all the ensuing consequences,' the president said (quoted by Interfax). Putin also announced that Russia has hypersonic and laser weapons."* Slon, 3/1/2018
 - b. **Commercial-** Virtually none of the sample featured commercial discussions, though two articles discussed private investors buying an almost majority share in Russian space and defense companies.
 - c. **Approaches-** Russia is presented as responding in weapons developments to U.S. aggressions, but doing so in a manner that is both economically responsible (asymmetrical response) and that is in accordance with existing weapons treaties. China and Russia are shown as attempting to work together toward securing a weapon's free outer space, while the U.S. escalates with a so-called, "Space Force."
 - i. *"The President noted that this in no way can be considered the beginning of an arms race - it is nothing more than a response to the US withdrawal from the ABM Treaty and a very active process of creating a global missile defense system, which, is capable of violating the strategic, nuclear parity and in fact neutralizing the strategic forces of the Russian Federation... Russia would not respond symmetrically, but it was an asymmetric response – 'about shock systems that can overcome any missile defense system "and which are incommensurably cheaper. To take this as a militaristic statement is wrong.' As the main part of the Message is also incorrect, the press secretary of the head of state stressed. 'Russia has been and continues to be a country that is looking for a mutually beneficial cooperation based on mutual respect and mutual trust with all countries'"* Rossiyskaya Gazeta 3/2/2018
 - ii. *"Trump's words can be assessed as a new step towards issues of an aggressive nature, and in relation not only to our country, but also to other states. The development of outer space in terms of the military component, the so-called space forces, of course, will not lead to anything good and once again speaks of the militaristic stance of the activities of the presidential administration."* Gazeta Russian 3/14/2018
2. What are the motivations of nation-state and non-state actors (e.g., violent extremists, etc.) to contest use of space in times of peace, instability, and conflict?
 - a. **Conflict for contested use:** Putin mentions use of nuclear force if Russia or its allies were attacked with a nuclear weapon or if Russia was attacked with a weapon that causes sizable damage.
 - b. **Instability motives for contesting use:** The potential arms race and buildup by the U.S. of a global defense system, along with its nuclear posturing are presented as leading Russia to develop weapons that allow it to defeat these systems. Trump's call for a Space Force is allude to as "opening Pandora's box" yet no exact mention of contesting this action is given.
 - c. **Peace motives for contested use:** N/A
3. What insight can the US/partners obtain from the space-based information service approaches used by international actors that lack their own space capabilities? N/A
4. How are the components of the commercial space industry allocated outside of the U.S.? Which countries have which types of market interests on the commercial end (e.g. tourism, imagery, navigation etc.)?
 - a. Coverage on launch to ISS, mentions that the U.S. is incapable of conducting its own space operations without the aid of private enterprise.
5. How do commercial ventures think about the security of their space assets during peacetime, crisis and conflict? Do industry leaders think about warfare in or through space differently than military leaders? What are their

- main concerns? How reliant are they on governments for warning or protection of space? What are their threat priorities?
- a. **Commercial security threats:** N/A
 - b. **Industry vs. Military warfare:** Military warfare and contrasting the abilities of various weapon systems was a major focus of the month's coverage.
 - c. **Industry Reliance of Gov. Protection/Support:** Military developments of weapon capabilities designed to defeat U.S. systems heavily reliant on Russian government support. Claims that Russia has the greatest scientist and engineers on the planet.
6. What are the principles (e.g., flexible v. controlled response; proportionality, etc.) upon which international policy makers should develop response options for aggression in space?
 - a. **Response to Aggression:** Federal Assembly speech literally demonstrates Russian offensive capabilities with its new weapons. These weapons are detailed at length, though they are claimed only as defensive weapons and would only be used if Russia or one of its allies suffered a nuclear attack (or Russia suffered a severe non-nuclear attack that would threaten the existence of the state).
 7. What insight on current space operations can we gain from understanding the approaches used for surveillance, reconnaissance, navigation, communication, timing synchronization, and indications and warning before the advent of the space age?
 - a. **Insights into Operations:** Tremendous detail on the capabilities of Russian weapons is given. How these weapons can be deployed, what they are capable of against specific targets, speed of the weapons, etc...is provided in the articles. Hypersonic and laser capabilities are specifically referenced often. However, there are some critical articles that point out Russia's economic failings likely limit these technologies from actually being workably deployed and that Putin is likely bluffing about these technologies in order to have an arms negotiation with the U.S.
 8. Are other nations outside the West poised to tap into their own commercial space industry for military purposes in the next 5-10 years?
 - a. **Own Commercial & Military Space Uses:** Russia's military capabilities in space given in great detail.
 9. Will major commercial space entities likely serve as disruptors or solid partners in terms of state national security interests? In the short term (5-10 years), mid-term (15-20 years) and long-term (25+ years)? N/A
 10. Which international actors currently have the greatest strategic risk in the space domain? What affordable non-space alternatives are there to mitigate or avoid that strategic risk?
 - a. **Actor Greatest Space Risk:** U.S. accused of weaponizing outer space and aiding in destabilizing the global order with its global missile defense system, nuclear posturing toward Russia, and its continued goals of expanding NATO eastward. The Space Force proposed by Donald Trump is mentioned as opening Pandora's box to the weaponization of outer space and being done solely to the benefit of the United States without consideration of the repercussions that would occur as a result.
 - b. **How to Mitigate Risk:** Arms treaties are often referenced as something the United States has been unwilling to work towards with Russia and that such efforts should be resumed.
 11. What can the US do to best facilitate development of verifiable norms that maintain a peaceful space domain?
 - a. **Best Practices for Norms & Peace:** Armament treaties to establish norms of weapon capabilities that allow defensive and offensive parity between Russia and the U.S. Withdraw of proposed Space Force, discussion of treaty related to demilitarizing outer space.

Chinese Report – September 2017 Data Pull

This report includes news reports from 16 Chinese news sources pulled from September 2017. The key term used: "Outer Space", duplications and irrelevant stories removed.

Ultimately, China wants to develop and maintain geopolitical partnerships pertaining to outer space network systems and technologies. While they believe there are economic incentives in commercializing space for China, the overwhelming majority of news stories are primarily concerned with the militarization aspects of

space. They believe the US is the leading instigator in space militarization, and they consistently advocate for geopolitical cooperation in maintaining the peaceful use of outer space.

1. How does each entity in the following categories conceive of space operations for military and commercial purposes? How do they approach space operations and services? Is there any difference in how their commercial ventures (if any) consider security during peace, crisis and conflict?
 - a. Military- The majority of these stories focus on developing network systems and technologies for military purposes so that China is better equipped for space warfare in the future. Also, many of these stories claim the U.S. is responsible for pushing the militarization of space.
 - b. Commercial- Although it is less frequently mentioned, some stories are optimistic about the economic development opportunities in outer space for China. Also, various stories claim the development of space markets development will be beneficial to the BRICS nations in the future.
 - c. Approaches- Large financial investments in network systems, space technologies, and infrastructure. These investments are often mentioned in the cooperative geopolitical context (e.g., agreements between China and Russia, China and Indonesia, the BRICS nations, and the United Nations).
2. What are the motivations of nation-state and non-state actors (e.g., violent extremists, etc.) to contest use of space in times of peace, instability, and conflict?
 - a. Conflict for contested use: Numerous stories reiterate that China is an advocate for the peaceful use of space. However, given the prominence of space militarization, China is forced to develop space defense systems to safeguard against future space warfare.
 - b. Instability motives for contesting use: Like the conflict category, in times of geopolitical instability (e.g., North Korea's nuclear weapons testing), China is forced to develop space defense systems to safeguard against future space warfare.
 - c. Peace motives for contested use: In times of peace, China could take advantage of the economic developmental opportunities in space technologies. China is also focused on how the use of space technologies could tackle environmental problems and threats (e.g., climate change). Furthermore, many stories discuss the possibilities of "Deep Space" exploration in the future (e.g., manned space mission to Mars).
3. What insight can the US/partners obtain from the space-based information service approaches used by international actors that lack their own space capabilities?
 - a. China is now eager to invest in more heavily in the space industry, primarily to safeguard against future space warfare, but also (like Russia) to capitalize on the future technologies and exploration potentials offered from space development.
4. How are the components of the commercial space industry allocated outside of the U.S.? Which countries have which types of market interests on the commercial end (e.g. tourism, imagery, navigation etc.)?
 - a. Geopolitical partnerships, high-tech space warfare weapon systems, anti-satellite missiles, laser weapons, GPS jammers and killer satellites, air defense and space defense integration, cruise missiles, satellites, orbiting space stations and space shuttles, air-to-air missiles, surface-to-air missiles, open-air missiles, high-power lasers, high-power microwave weapons and particle beam weapons, and hypersonic spacecraft technology.
5. How do commercial ventures think about the security of their space assets during peacetime, crisis and conflict? Do industry leaders think about warfare in or through space differently than military leaders? What are their main concerns? How reliant are they on governments for warning or protection of space? What are their threat priorities?
 - a. Commercial security threats: The growing militarization of space by Western nations (especially the U.S.) have caused geopolitical tensions.
 - b. Industry vs. Military warfare: High concern regarding the militarization of space, and far less concern regarding the commercial or industry warfare of space.
 - c. Industry Reliance of Gov. Protection/Support: The Chinese space industry relies heavily on the Chinese government for support in funding and infrastructural development.
6. What are the principles (e.g., flexible v. controlled response; proportionality, etc.) upon which international policy makers should develop response options for aggression in space?

- a. Response to Aggression: Once again, the majority of news stories discuss how China is a proponent of maintaining the peaceful use of space. They emphasize geopolitical partnerships as combative measures against the U.S. militarization of space.
7. What insight on current space operations can we gain from understanding the approaches used for surveillance, reconnaissance, navigation, communication, timing synchronization, and indications and warning before the advent of the space age?
 - a. Insights into Operations: China is making large investments (and often collaborating with other nations) to develop high-tech space technologies and network systems to combat against potential threats of future space warfare.
8. Are other nations outside the West poised to tap into their own commercial space industry for military purposes in the next 5-10 years?
 - a. Own Commercial & Military Space Uses: China, Russia, and Indonesia are the nations that are most frequently mentioned in the news stories.
9. Will major commercial space entities likely serve as disruptors or solid partners in terms of state national security interests? In the short term (5-10 years), mid-term (15-20 years) and long-term (25+ years)?
 - a. Short-Term: Solid partners*
 - b. Mid-Term: Solid partners*
 - c. Long-Term: Solid partners*

*Note: U.S. commercial space entities are presented as partners only in discussions of future “Deep Space” exploration.
10. Which international actors currently have the greatest strategic risk in the space domain? What affordable non-space alternatives are there to mitigate or avoid that strategic risk?
 - a. Actor Greatest Space Risk: The United States, BRICS nations, North Korea, and Iran.
 - b. How to Mitigate Risk: More commercial and military cooperation in the geopolitical context (e.g., the United Nations, the G-20 and BRICS nations) to uphold the peaceful use of space.
11. What can the US do to best facilitate development of verifiable norms that maintain a peaceful space domain?
 - a. Best Practices for Norms & Peace: Uphold the principle of the peaceful uses of outer space, stressing the need to strengthen international cooperation in space activities and the use of space technology to address global climate change, environmental protection, disaster relief and other human challenges.

Chinese Report - October Data Pull

This report includes news reports from 16 Chinese news sources pulled from October 2017. The key term used: “Outer Space”, duplications and irrelevant stories were removed.

Parallel to the September news stories, China wants to develop and maintain geopolitical partnerships (primarily with other BRICS nations) pertaining to outer space network systems and technologies. While they believe there are economic incentives in commercializing space for China, the overwhelming majority of news stories are primarily concerned with the militarization aspects of space. They believe the US is the leading instigator in space militarization, and they consistently advocate for geopolitical cooperation in maintaining the peaceful use of outer space.

1. How does each entity in the following categories conceive of space operations for military and commercial purposes? How do they approach space operations and services? Is there any difference in how their commercial ventures (if any) consider security during peace, crisis and conflict?
 - a. Military- The majority of these stories focus on making space/military technological developments so that China is better equipped for space warfare in the future as a response to the militarization of space by the West.
 - b. Commercial- These stories claim that China is optimistic about its future economic development opportunities pertaining to outer space. The most frequently mentioned space market was tourism.
 - c. Approaches- Large financial investments in network systems, space technologies, and infrastructure. These investments are often mentioned in the cooperative geopolitical context (e.g.,

agreements between China and Russia, China and Indonesia, the BRICS nations, the G-20 nations, and the U.N.).

2. What are the motivations of nation-state and non-state actors (e.g., violent extremists, etc.) to contest use of space in times of peace, instability, and conflict?
 - a. Conflict for contested use: Numerous stories reiterate that China is an advocate for the peaceful use of space. However, given the prominence of space militarization, China is forced to develop space defense systems to safeguard against future space warfare.
 - b. Instability motives for contesting use: Like the conflict category, in times of geopolitical instability (e.g., North Korea's nuclear weapons testing), China is forced to develop space defense systems to safeguard against future space warfare.
 - c. Peace motives for contested use: In times of peace, China could take advantage of the economic developmental opportunities in space technologies. China is also focused on how the use of space technologies could tackle environmental problems and threats (e.g., climate change). Furthermore, many stories discuss the possibilities of "Deep Space" exploration in the future (e.g., manned space mission to Mars).

*Note: The stories often discuss geopolitical partnerships (e.g., with the BRICS nations) for times of peace, instability, and conflict.
3. What insight can the US/partners obtain from the space-based information service approaches used by international actors that lack their own space capabilities?
 - a. China is now eager to invest in more heavily in the space industry, primarily to safeguard against future space warfare, but also (like Russia) to capitalize on the future technologies and exploration potentials offered from space development.
4. How are the components of the commercial space industry allocated outside of the U.S.? Which countries have which types of market interests on the commercial end (e.g. tourism, imagery, navigation etc.)?
 - a. Space tourism, manned spacecraft, geopolitical partnerships, high-tech space warfare weapon systems, anti-satellite missiles, laser weapons, air defense and space defense integration, cruise missiles, satellites, orbiting space stations and space shuttles, air-to-air missiles, surface-to-air missiles, open-air missiles, high-power lasers, high-power microwave weapons and particle beam weapons, and hypersonic spacecraft technology.
5. How do commercial ventures think about the security of their space assets during peacetime, crisis and conflict? Do industry leaders think about warfare in or through space differently than military leaders? What are their main concerns? How reliant are they on governments for warning or protection of space? What are their threat priorities?
 - a. Commercial security threats: The growing militarization of space by Western nations (especially the U.S.) have caused geopolitical tensions.
 - b. Industry vs. Military warfare: High concern regarding the militarization of space, and far less concern regarding the commercial or industry warfare of space.
 - c. Industry Reliance of Gov. Protection/Support: The Chinese space industry relies heavily on the Chinese government for support in funding and infrastructural development.
6. What are the principles (e.g., flexible v. controlled response; proportionality, etc.) upon which international policy makers should develop response options for aggression in space?
 - a. Response to Aggression: Once again, the majority of news stories discuss how China is a proponent of maintaining the peaceful use of space. They emphasize geopolitical partnerships (especially with Russia) as combative measures against the U.S. militarization of space.
7. What insight on current space operations can we gain from understanding the approaches used for surveillance, reconnaissance, navigation, communication, timing synchronization, and indications and warning before the advent of the space age?
 - a. Insights into Operations: China is making large investments (and often collaborating with other nations) to develop high-tech space technologies and network systems to combat against potential threats of future space warfare. Also, China and Russia appear deeply committed to joint collaboration efforts.
8. Are other nations outside the West poised to tap into their own commercial space industry for military purposes in the next 5-10 years?
 - a. Own Commercial & Military Space Uses: Brazil, China, Russia, Indonesia, and Turkey are the nations that are most frequently mentioned in the news stories.

9. Will major commercial space entities likely serve as disruptors or solid partners in terms of state national security interests? In the short term (5-10 years), mid-term (15-20 years) and long-term (25+ years)?
 - a. Short-Term: Solid partners*
 - b. Mid-Term: Solid partners*
 - c. Long-Term: Solid partners*
10. Which international actors currently have the greatest strategic risk in the space domain? What affordable non-space alternatives are there to mitigate or avoid that strategic risk?
 - a. Actor Greatest Space Risk: The United States, BRICS nations, North Korea, and Iran.
 - b. How to Mitigate Risk: More commercial and military cooperation in the geopolitical context (e.g., the United Nations, the G-20 and BRICS nations) to uphold the peaceful use of space.
11. What can the US do to best facilitate development of verifiable norms that maintain a peaceful space domain?
 - a. Best Practices for Norms & Peace: Uphold the principle of the peaceful uses of outer space, stressing the need to strengthen international cooperation in space activities and the use of space technology to address global climate change, environmental protection, disaster relief and other human challenges.

Chinese Report - November Data Pull

This report includes news reports from 16 Chinese news sources pulled from November 2017. The key term used: “Outer Space.” After removing duplicated and irrelevant stories, a total of 97 distinct news stories were analyzed for this report.

Overall, the main narratives focus on: China’s development of space technologies and global leadership in space, geopolitical tensions between the U.S. and other nations (e.g., North Korea, Iran, and Russia), potential geopolitical partnerships to enhance China’s commercial and military uses of outer space (e.g., Russia, the U.N., and BRICS nations), the economic incentives for China in commercializing space, and the national security incentives for militarizing space by developing defense systems to protect China against future nuclear warfare.

The Chinese news media consistently emphasized the importance of space development and innovation to China’s wellbeing in future economic, military, and national security matters. The stories address plans for substantial increases of future state-funded investments into the development of space technologies (both for commercial and military purposes). Regarding the commercial purposes, the stories discussed the development of: the Chinese large modular space station, orbiting satellites, reusable rockets, nuclear-powered space shuttles, commercial partnerships for future space exploration missions to Mars, and commercial partnerships with several nations (e.g., Russia, the U.N., BRICS nations, neighboring Asian nations, and numerous Middle Eastern nations).

Many Chinese news stories focused on geopolitical tensions between the U.S. and Russia. While China appears rather cautious of both nations, they seem far more trusting and optimistic about working with Russia than they are about working with the U.S. in the future. Furthermore, the stories reiterate claims that they are catching the U.S. in the space industry and anticipate passing the U.S. to become the world’s leader in space in the next decade. Regarding the military purposes, the stories primarily discussed the development of Chinese anti-missile defense systems to combat future nuclear warfare. Akin to the stories from previous reports, the Chinese media repeatedly emphasize the need to maintain the peaceful use of outer space. Furthermore, they seem highly anxious about the developments of nuclear weapons capabilities in North Korea, Iran, and the U.S., and claim it is imperative for China to establish anti-missile defense systems as a matter of national security.

1. How does each entity in the following categories conceive of space operations for military and commercial purposes? How do they approach space operations and services? Is there any difference in how their commercial ventures (if any) consider security during peace, crisis and conflict?
 - a. Military: These stories primarily focus on the need to develop anti-missile defense systems in outer space so that China is better equipped to protect itself against future nuclear warfare.

- b. Commercial: These stories claim that China is becoming increasingly optimistic about its future economic development opportunities pertaining to outer space. The most frequently mentioned space market was future space-flight exploration missions to Mars.
 - c. Approaches: Large financial investments in network systems, space technologies, and infrastructure. These investments are often mentioned in the cooperative geopolitical context (e.g., agreements between China and Russia, the BRICS nations, and the U.N.).
- 2. What are the motivations of nation-state and non-state actors (e.g., violent extremists, etc.) to contest use of space in times of peace, instability, and conflict?
 - a. Conflict for contested use: Numerous stories reiterate that China is an advocate for the peaceful use of space. However, given the prominence of space militarization, China is forced to develop space defense systems to safeguard against future space warfare.
 - b. Instability motives for contesting use: Like the conflict category, in times of geopolitical instability (e.g., the Korean nuclear crisis), China is forced to develop space defense systems to safeguard against future space warfare.
 - c. Peace motives for contested use: In times of peace, China could take advantage of the economic developmental opportunities in space technologies. China is also focused on how the use of space technologies could tackle environmental problems and threats (e.g., climate change). Furthermore, many stories discuss the possibilities of “Deep Space” exploration in the future (e.g., manned space mission to Mars).
- 3. What insight can the US/partners obtain from the space-based information service approaches used by international actors that lack their own space capabilities?
 - a. China is now eager to invest in more heavily in the space industry, primarily to safeguard against future space warfare, but also to work with other nations (e.g., Russia, the U.N., BRICS nations, neighboring Asian nations, and numerous Middle Eastern nations) to capitalize on the future technologies and exploration potentials offered from space development.
- 4. How are the components of the commercial space industry allocated outside of the U.S.? Which countries have which types of market interests on the commercial end (e.g. tourism, imagery, navigation etc.)?
 - a. Manned space exploration missions, nuclear-powered space shuttles, geopolitical partnerships, high-tech space warfare weapon systems, anti-satellite missiles, laser weapons, air defense and space defense integration, cruise missiles, satellites, orbiting space stations and space shuttles, air-to-air missiles, surface-to-air missiles, open-air missiles, high-power lasers, high-power particle beam weapons, and hypersonic spacecraft technology.
- 5. How do commercial ventures think about the security of their space assets during peacetime, crisis and conflict? Do industry leaders think about warfare in or through space differently than military leaders? What are their main concerns? How reliant are they on governments for warning or protection of space? What are their threat priorities?
 - a. Commercial security threats: The growing militarization of space by Western nations (especially the U.S.) have caused geopolitical tensions.
 - b. Industry vs. Military warfare: High concern regarding the militarization of space, and growing concern regarding the commercial or industry warfare of space due to competition for the new “space race.”
 - c. Industry Reliance of Gov. Protection/Support: The Chinese space industry relies heavily on the Chinese government for support in funding and infrastructural development, but they are optimistic about future geopolitical partnerships in the commercial space sector.
- 6. What are the principles (e.g., flexible v. controlled response; proportionality, etc.) upon which international policy makers should develop response options for aggression in space?
 - a. Response to Aggression: These stories reiterate the fact that China is a proponent of maintaining the peaceful use of outer space. They continue to emphasize future geopolitical partnerships (especially with Russia) as combative measures against the U.S. militarization of space.
- 7. What insight on current space operations can we gain from understanding the approaches used for surveillance, reconnaissance, navigation, communication, timing synchronization, and indications and warning before the advent of the space age?
 - a. Insights into Operations: China is making large investments (and plans on collaborating with several nations) to develop high-tech space technologies and network systems to combat against potential threats of future space warfare. These stories continue to claim that Russia appears the most deeply committed to future space collaboration efforts with China.

8. Are other nations outside the West poised to tap into their own commercial space industry for military purposes in the next 5-10 years?
 - a. Own Commercial & Military Space Uses: the most frequently mentioned nations in these news stories are China, Russia, BRICS nations, and Middle Eastern nations (e.g., Iraq and Pakistan).
9. Will major commercial space entities likely serve as disruptors or solid partners in terms of state national security interests? In the short term (5-10 years), mid-term (15-20 years) and long-term (25+ years)?
 - a. Short-Term: Solid partners
 - b. Mid-Term: Solid partners
 - c. Long-Term: Solid partners
10. Which international actors currently have the greatest strategic risk in the space domain? What affordable non-space alternatives are there to mitigate or avoid that strategic risk?
 - a. Actor Greatest Space Risk: Although these stories overwhelmingly focus on the risks to China, some also mention the U.S., the U.N., and other BRICS nations.
 - b. How to Mitigate Risk: More commercial and military cooperation in the geopolitical context (e.g., the United Nations and BRICS nations) to uphold the peaceful use of space.
11. What can the US do to best facilitate development of verifiable norms that maintain a peaceful space domain?
 - a. Best Practices for Norms & Peace: Uphold the principle of the peaceful uses of outer space, emphasizing the need to strengthen global cooperation in space development activities, and the need to use space technological innovations to address problems facing the environment.

Chinese Report - December Data Pull

This report includes news reports from 12 Chinese news sources pulled from December 2017. The key term used: “Outer Space.” After removing duplicated and irrelevant stories, a total of 93 distinct news stories were analyzed for this report.

Parallel to the November news stories, the overall narratives focused on: China’s development of space technologies and global leadership in space, geopolitical tensions between the U.S. and other nations (e.g., North Korea, Iran, and Russia), potential geopolitical partnerships to enhance China’s commercial and military uses of outer space (e.g., Russia, the U.N., and BRICS nations), the economic incentives for China in commercializing space, and the national security incentives for militarizing space by developing defense systems to protect China against future nuclear warfare.

The Chinese news stories continued to emphasize the importance of space development and technological innovation to China’s wellbeing in future economic, military, and national security matters. The stories address China’s plans in 2018 for substantial increases of future state-funded investments into the development of space technologies (both for commercial and military purposes). Regarding the commercial purposes, the stories discussed the development of: global commercial partnerships for future space exploration missions (e.g., the developments of “Blue Origin” and “SpaceX” commercial space flights), the Chinese large modular space station, orbiting satellites, reusable rockets, nuclear-powered space shuttles, and possible commercial partnerships with several nations other than the U.S. (e.g., Russia, the U.N., BRICS nations, neighboring Asian nations, and numerous Middle Eastern nations).

The Chinese news media also focused on geopolitical tensions between the U.S. and various nations (e.g., North Korea, Iran, Russia, and China). The stories also claim that China has rather distrusting relations with the U.S. and with India and Japan, which the stories call “two extremely anti-China countries in Asia,” are trying to pass China as the world’s 2nd leading nation in the space industry, and also claims that China is closely monitoring the competitive development of space technologies in these nations. Furthermore, the stories reiterate claims that they are catching the U.S. in the space industry and anticipate passing the U.S. to become the world’s leader in space in the next decade. Regarding the military purposes, the stories primarily discussed the development of Chinese anti-missile defense systems to combat future nuclear warfare. Akin to the stories from previous reports, the Chinese media repeatedly emphasize the need to maintain the peaceful use of outer space.

Furthermore, they seem highly anxious about the developments of nuclear weapons capabilities in North Korea, Iran, and the U.S., and claim China must establish anti-missile defense systems as a matter of national security.

1. How does each entity in the following categories conceive of space operations for military and commercial purposes? How do they approach space operations and services? Is there any difference in how their commercial ventures (if any) consider security during peace, crisis and conflict?
 - a. Military: These stories primarily focus on the need to develop anti-missile defense systems in outer space so that China is better equipped to protect itself against future nuclear warfare.
 - b. Commercial: These stories claim that China is becoming increasingly optimistic about its future economic development opportunities pertaining to outer space. The most frequently mentioned space market was future commercial space-flights (e.g., “Blue Origin” and “Space-X”).
 - c. Approaches: Large financial investments in network systems, space technologies, and infrastructure. These investments are often mentioned in the cooperative geopolitical context (e.g., agreements between China and Russia, the BRICS nations, and the U.N.).
2. What are the motivations of nation-state and non-state actors (e.g., violent extremists, etc.) to contest use of space in times of peace, instability, and conflict?
 - a. Conflict for contested use: Numerous stories reiterate that China is an advocate for the peaceful use of space. However, given the prominence of space militarization, China is forced to develop space defense systems to safeguard against future space warfare.
 - b. Instability motives for contesting use: Like the conflict category, in times of geopolitical instability (e.g., the Korean nuclear crisis), China is forced to develop space defense systems to safeguard against future space warfare.
 - c. Peace motives for contested use: In times of peace, China could take advantage of the economic developmental opportunities in space technologies. China is also focused on how the use of space technologies could tackle environmental problems and threats (e.g., climate change). Furthermore, many stories discuss the possibilities of future space tourism (e.g., “Blue Origin” and “Space-X”) and “Deep Space” (e.g., manned space-flight missions to Mars) explorations.
3. What insight can the US/partners obtain from the space-based information service approaches used by international actors that lack their own space capabilities?
 - a. China is now eager to invest in more heavily in the space industry, primarily to safeguard against future space warfare, but also to work with other nations (e.g., Russia, the U.N., BRICS nations, neighboring Asian nations, and numerous Middle Eastern nations) to capitalize on the future technologies and exploration potentials offered from space development.
4. How are the components of the commercial space industry allocated outside of the U.S.? Which countries have which types of market interests on the commercial end (e.g. tourism, imagery, navigation etc.)?
 - a. Space tourism, manned space-flight exploration missions, nuclear-powered space shuttles, geopolitical partnerships, high-tech space warfare weapon systems, anti-satellite missiles, air defense and space defense integration, cruise missiles, satellites, orbiting space stations and space shuttles, air-to-air missiles, surface-to-air missiles, open-air missiles, and hypersonic spacecraft technology.
5. How do commercial ventures think about the security of their space assets during peacetime, crisis and conflict? Do industry leaders think about warfare in or through space differently than military leaders? What are their main concerns? How reliant are they on governments for warning or protection of space? What are their threat priorities?
 - a. Commercial security threats: The growing militarization of space by Western nations (especially the U.S.) have caused geopolitical tensions.
 - b. Industry vs. Military warfare: High concern regarding the militarization of space, and growing concern regarding the commercial or industry warfare of space due to competition for the new “space race.”
 - c. Industry Reliance of Gov. Protection/Support: The Chinese space industry relies heavily on the Chinese government for support in funding and infrastructural development, but they are optimistic about future geopolitical partnerships in the commercial space sector.
6. What are the principles (e.g., flexible v. controlled response; proportionality, etc.) upon which international policy makers should develop response options for aggression in space?

- a. Response to Aggression: These stories reiterate the fact that China is a proponent of maintaining the peaceful use of outer space. They continue to emphasize future geopolitical partnerships (especially with Russia) as combative measures against the U.S. militarization of space.
7. What insight on current space operations can we gain from understanding the approaches used for surveillance, reconnaissance, navigation, communication, timing synchronization, and indications and warning before the advent of the space age?
 - a. Insights into Operations: China is making large investments (and plans on collaborating with several nations) to develop high-tech space technologies and network systems to combat against potential threats of future space warfare. These stories continue to claim that Russia appears the most deeply committed to future space collaboration efforts with China.
8. Are other nations outside the West poised to tap into their own commercial space industry for military purposes in the next 5-10 years?
 - a. Own Commercial & Military Space Uses: the nations that are most frequently mentioned in these news stories are China, Russia, India, and Japan.
9. Will major commercial space entities likely serve as disruptors or solid partners in terms of state national security interests? In the short term (5-10 years), mid-term (15-20 years) and long-term (25+ years)?
 - a. Short-Term: Solid partners
 - b. Mid-Term: Solid partners
 - c. Long-Term: Solid partners
10. Which international actors currently have the greatest strategic risk in the space domain? What affordable non-space alternatives are there to mitigate or avoid that strategic risk?
 - a. Actor Greatest Space Risk: Although these stories overwhelmingly focus on the risks to China, some also mention the U.S., North Korea, Iran, India, Japan, and Russia.
 - b. How to Mitigate Risk: More commercial and military cooperation in the geopolitical context (e.g., the United Nations and BRICS nations) to uphold the peaceful use of space.
11. What can the US do to best facilitate development of verifiable norms that maintain a peaceful space domain?
 - a. Best Practices for Norms & Peace: Uphold the principle of the peaceful uses of outer space, emphasizing the need to strengthen global cooperation in space development activities, and the need to use space technological innovations to address problems facing the environment.

Appendix 2: Coding Scheme

Explanation of Code Book		Coding Example	Coding Example
<p>The first thing you should do is put an extra column next to all of the categories we have in the code sheet. Once that is done we can begin the coding process. To start, look at all of the categories that we have and understand that you will be marking a (1) if the category is present/mentioned in the article, and a (0) if it is not mentioned. Only code that which is mentioned in the article, do not speculate on motives, only code motives if they are mentioned in the story. Your goal is to be an objective observer and recorder of content. The categories can be defined as the following:</p>	<p>The coding examples serve to show how to code the categories if the content were present to mark a 1 in the coding column</p>		
<p>Military Conceptions</p>	<p>The Category [Military Conceptions] refers to military conceptions of outer space related to operations. An example of this might be the mention of the actor placing a defense shield in space to destroy enemy missiles or satellites. If such a sentence existed in the article you would mark 1 in the military column and then describe in the next column the mention of the defense shield being put in outer space. This would let us know that China, in the one article, conceived of military operations in space as defensive and specifically meant to defend against missiles or satellites.</p>	<p>1</p>	<p>Defense Shield to protect from missiles and satellites</p>
<p>Commercial Conceptions</p>	<p>This category will be thought of exactly the same as the above military category, except in reference to commercial ventures. In this case we want to pay attention to specific commercial actors being mentioned and the types of partnerships conceived of. For example, if the article mentions that the actor will be working with Space X to attempt to mine asteroid material. It would be coding as you see to the right</p>	<p>1</p>	<p>Working with Space X, Commercial Mining of Resources in Outer Space</p>
<p>Approach Space Operations and Services</p>	<p>This category asks how space operations are approached; think of this as the amount of openness that is tolerated when it comes to space planning and services. Look for things like whether the government is trying to expand operations, seeking cooperation with other nations, or whether or not they view outsiders as a threat to their own control of the space environment. An article that mentioned an ambitious new rocket program in partnership with the US to put tourists in space might be coding as follows:</p>	<p>1</p>	<p>Ambitious, seeking partner in Space Tourism sector</p>
<p>Commercial Security during peace, crisis, conflict</p>	<p>This category is different from the previous ones in that it asks you to consider commercial security in times of peace, crisis, or conflict. The first factor you should identify is</p>	<p>1</p>	<p>In Crisis, concern for commercial satellites because of infrastructure threat. Measures to protect taken</p>

	whether there is any discussion of peace, conflict, crisis then relate that over to conversations on commercial security. For example, if an article said "because of the weapons tests by N. Korea, the actor has decided to take measures to protect its commercial satellites in order to protect its infrastructure..." This would be coded as the following:		
Peace Motives	The next series of categories ask you to look at the actor in terms of its motives to CONTEST use space during peace, instability, and conflict. Let's look at peace motives first. Contest, or challenge, being the key word. What are the primary reasons, during peace time that the actor seeks contest others using space.... do they take exception to exploration, mining resources, harvesting energy sources, credit for scientific discoveries, etc... An example might be coded as follows, the actor might take exception to the US attempting to crash a probe into Saturn claiming it would disrupt the natural order of the planet.	1	Contests crashing of probe by US into planet, citing environmental/ planetary impacts
Instability Motives	Instability motives will be coded similar to peace motives. The distinction being the term "instability" in this case we are using the word instability to mean disruption to the global system in ways that do not involve outright war. For example, the actor's infrastructure being hacked by an outsider, or the actor being blamed for hacking another country, an economic crisis, migrant crisis or disputed political results can all be thought of as events that cause system instability. If an article references to Contests actions in space related to instability or potential for instability, we will attempt to code the stated motive for that action.	1	China challenges Spain's proposal to attempt to become a leader in the private space sector because of instability in EU
Conflict Motives	Very simply, in conflict what are the primary motives for contesting use of space. Things like distrust, security challenges, system fragility, can all be reasons to contest the use of space by others during times of conflict. For example, the US says it wants to launch a new satellite in space that is strictly a defensive shield because of increased threats from N.K. and a coming potential conflict. The actor might contest this satellite claiming it is an offensive weapon, not a defensive one.	1	Claims US defensive satellite is a weapon that could launch attacks on Chinese assets. China demands its removal
Space Markets	Are commercial space markets mentioned: tourism, physical sciences, navigational development, imagery testing, mining?	1	mining asteroids
Commercial Security (Threat Priorities)	What commercial assets are mentioned as most important during times of potential conflict?	1	Telecommunication satellites mentioned as vulnerable and very important

Industry Warfare vs Military Warfare	This category deals with fair practice industry competition versus when those actions might lead to military actions. Are there clear mentions of when an action by another commercial entity would be considered an act of war by the actor's government? How are industries allowed to or expected to compete with one another vs. military?	1	China sees actions against its private companies as an act of war
Industry Reliance of Govt. Protection/Support	Does the article mention whether or not the actor's space industry requires the Government for support and protections? What are those protections and services?	1	Chinese government subsidizing private companies to make them more competitive against European companies.
Response to Aggression	This is one of the most important categories in our data set. ANY mention of ANY type of SIGNAL to space aggression. If they are responding to space aggression, any outcome MUST be noted: diplomats being removed, summits canceled, dinners not attended, moving military equipment, etc....	1	Chinese Premier cancels trade summit with Russia over Russia's space defense program
Insights into Operations	Look for any mentions of special programs or new technology or capabilities	1	Claims development of technology to harness solar wind
Own Commercial and Military Space Uses	Are there direct mentions of commercial or military ventures in challenge to those by the West?	1	China to found a company to compete with Space X
Disruptive or Cooperative Partners (Long, Medium, Short, Range)	Very simply, does the actor see commercial companies as solid partners or disrupters to norms of space in the short to long range future.	1	China concerned that emerging satellite companies will create a challenge for space launches in the future as an increasing amount of debris and junk is in outer space.
Actor Greatest Space Risk	What does the article mention the actor seeing as the largest threat to outer space?	1	China sees US Space Corps as greatest threat to space security.
How to Mitigate Risk	If a risk is mentioned in the article, is a way of mitigating or lessening that risk mentioned by the actor.	1	To mitigate the risk of US space corps, China proposes a global Space force
Best Practices for Norms and Peace	Are any best practices towards peace in space and norms of usage mentioned? What are they?	1	Regular international delegations on Space Use called for by China to avoid warfare escalation

Appendix 3: List of Chinese and Russian News Sources

Chinese Sources	Russian Sources
Caixin	http://kremlin.ru/
Cankao Xiaoxi	http://en.roscosmos.ru/
CCTV/Phoenix Info News	Rossiya24
Enlightenment Daily	Slon
Global Times	Rossiyskaya Gazeta
Jingji Cankao Bao	Gazeta Russian
Ministry Foreign Affairs	InoPressa
News 163	Grani
Qingdao News	Kommersant
QQ News	Komsomolskaya Pravda
Remin Ribao	Chastny Korrespondent
Sina	Sobkorr
Sohu News	Pravda.ru
Tiexue	Kasparov
Xinhuanet	Moskovskij Komsolets
Zhongguo Qingnian Bao	Izvestia