

“Despite its breath-taking developments in the last twenty years, China has not yet emerged as a great power with the necessary capacity and quality to be able to influence economic, political, social, and military developments worldwide,”³ Xuewu Gu, Acting Chair in the Department of Political Science at the University of Trier, concluded in 1999. In view of the discussion on hybrid threats that emerged about ten years later and has continued to this day, it is interesting to note that Dr. Gu concluded, “Last but not least, China still lacks cultural attractiveness, i.e. soft power, the ability to influence other states according to its own will, without having to resort to pressure or force.”⁴ More than 20 years later, this view of security policy is likely to meet with divergent reactions.

The concept of hybrid threat, i.e. influencing states with different means and methods, tactics and strategies, is not new. Even the use of “directed” information processing as well as economic coercion have been known as means to achieve strategic goals at least since the Cold War era. Even the use of task forces to support or overthrow regimes is not new. However, an intensive, open discussion on possible forms of state aggression in this regard has only been discernible for about ten years. New technologies and their dynamics, such as cyber means, or current forms of communication, such as social media, have – in terms of dissemination and time – brought a further momentum to power-political game variants. Aggression can take place under the form of covert action or as political, economic, socio-political or even technological activities in legally grey areas. Even reinterpretations of state efforts to protect human rights as well as maintain sovereignty can be turned into the opposite by corresponding discrediting approaches. Almost any positive action by an actor can be reinterpreted by using fake news or by calling it a “conspiracy theory,” thus influencing a government’s policies. Different narratives could be used to justify hybrid

³ The original quotation reads: “China ist trotz seiner atemberaubenden Entwicklungen in den letzten zwanzig Jahren noch nicht zu einer Großmacht aufgestiegen, die über die notwendige Kapazität und Qualität verfügt, wirtschaftliche, politische, gesellschaftliche und militärische Entwicklungen weltweit beeinflussen zu können.” Xuewu Gu, “Chinas Aufstieg zur Weltmacht?”, in *Jahrbuch für internationale Sicherheitspolitik* 1999, ed. Erich Reiter (Hamburg Berlin Bonn, Mittler & Sohn GmbH, 1999), 631-46, 645.

⁴ *Ibid*, 646. The original quotation reads: “*Last but not least* fehlt China noch die kulturelle Attraktivität, also die soft power, die Fähigkeit, andere Staaten nach dem eigenen Willen zu beeinflussen, ohne auf Druck, bzw. Gewalt zurückgreifen zu müssen.”

actions. Various Western states accuse China of being a hybrid actor that uses its own means of power to influence the EU.

China as a perceived hybrid power factor

In recent years, accusations have been mounting in the Western world that China's aggressive policies pose an increasing threat. Countless examples bear witness to this. As early as in 1994, the daily newspaper *taž* described China as a new adversary of the USA. Telephone interviews conducted in 2019 showed that 41% of those questioned named China as the region from which, in their view, a particularly high threat potential emanated in terms of industrial espionage and data theft. In second place of this survey came Russia with 31%, followed by the USA with 14%. Moreover, the fact that in the ranking of the 15 countries with the highest military expenditure worldwide China (252 billion USD) comes already second⁵ behind the USA (778 billion USD)⁶ is also regarded as a threat. Even though the USA invests most in its military budget, China has the world's largest army in terms of soldiers (2.2 million).⁷

Furthermore, particularly major cyberattacks on Western institutions have repeatedly been attributed to Chinese hackers. The *New York Times*, for example, blames the blackout in the Indian megacity of Mumbai in October 2020 on a Chinese cyberattack.

Clive Hamilton, professor of public ethics at the University of Canberra, writes in his book⁸ about a secretive military use of several islands in the South China Sea. This would amount to both soft and hard power projection.

⁵ Diego Lopes da Silva, Nan Tian and Alexandra Marksteiner: "Trends in World Military Expenditure", 2020, *SIPRI Fact Sheet*, April 2021, https://sipri.org/sites/default/files/2021-04/fs_2104_milex_0.pdf.

⁶ According to Statista: source SIPRI. All figures are estimations. Expenditure values have been converted to US dollars based on current prices and exchange rates.

⁷ Statista Research Department, "Ranking der 15 Länder mit den weltweit höchsten Militärausgaben im Jahr 2020", survey period 2020, published by *Statista Research Department*, May 26, 2021, <https://de.statista.com/statistik/daten/studie/157935/umfrage/laender-mit-den-hoechsten-militaerausgaben/>.

⁸ Clive Hamilton and Mareike Ohlberg, "Die lautlose Eroberung: Wie China westliche Demokratien unterwandert und die Welt neue ordnet", *Deutsche Verlagsanstalt*, München, 2020, Kindle version.

The European narrative of hybrid threats

But what is the EU's narrative on hybrid actions? Is it comparable to that of China? What is the Chinese narrative on soft power projection? A closer look at the similarities and contrasts in this regard will therefore be taken at the outset. To understand China and its strategy, it is sometimes necessary to use Chinese glasses.

First, there is no more a global definition of hybrid threats than there is of terrorism. Experts in the EU member states define this term in differing ways, even if the EU is aiming at a uniform understanding. The European Commission describes a hybrid threat as the concept of a mixture “[...] of coercive and subversive activity, conventional and unconventional methods (i.e. diplomatic, military, economic, technological), which can be used in a coordinated manner by state or non-state actors to achieve specific objectives while remaining below the threshold of formally declared warfare.”⁹ Hybrid threats are of essential importance with regard to “[...] national security and defence and the maintenance of law and order [...]”¹⁰

China considers the concept of hybrid warfare to be of Western origin and, therefore, to follow Western narratives. Although this discourse is pursued by China, it should be countered “[...] without using the corresponding internationally common key terms,”¹¹ whereby the overriding strategic objective is to weave Chinese narratives into global discourses.

In this context, a possible Chinese narrative for “good” governance is outlined at first. In order to transform a country, the size of China, it has “[...] to follow certain ideas, some of which may have implications far

⁹ European Commission, “Joint Framework on countering hybrid threats – a European Union response,” Brussels, April 6, 2016, JOIN (2016) 18 final, 2, <http://ec.europa.eu/DocsRoom/documents/16201>.

¹⁰ Ibid.

¹¹ The original quotation reads: “ohne die entsprechenden international gängigen Schlüsselbegriffe anzuwenden”, Doris Vogl, “Volksrepublik China. Zivilisationsanspruch und Wahrnehmung hybrider Bedrohungen,” in *Wissenschaft & Frieden 2019-3: Hybrider Krieg?*, 20-22, <https://www.wissenschaft-und-frieden.de/seite.php?artikelID=2381>.

beyond China's borders."¹² Therefore, the following concepts should be applied:

- Shishi Qiushi (Seeking Truth from Facts): This emphasises, in particular, China's emergence by peaceful means, without war.
- Minsheng weida (Primacy of People's Livelihood): The livelihood of the people is the cornerstone of a state.
- Zhengti siwei (Holistic Thinking): Holistic thinking is perceived as important. The whole is seen as greater than the combination of its parts.
- Zhengfu shi biyaodeshan (Government as a Necessary Virtue): China relies on the advantages of a strong state. Only such a state forms a protective shield for the economy and, thus, for society.
- Liangzheng shanzhi (Good Governance): The ultimate test of a "good" political system is the extent to which it can provide governance.
- Minxin xiangbei and xuanxian reneng (Winning the Hearts and Minds of the People and Meritocracy): It discusses the Chinese idea of political governance. Only when rulers work diligently, can they be assured to win the hearts of the people.
- Jianshou bingxu (Selective Learning and Adaptation): Learning from others is highly valued.
- Hexie zhongdao (Harmony and Moderation): This is attributed to Chinese culture: as the latter is strengthened by Confucianism, the value of harmony prevails over confrontation.

The basic idea of the above-mentioned concepts applies to internal governance but could just as successfully be applied externally. Thus, these ideas imply the hybrid strategies of a Western understanding, especially with regard to "soft power."

¹² Zhang Weiwei, "The China Wave. Rise of a Civilizational State", Published by World Century Publishing Corporation, originally published in Chinese 2011, 125, <https://is.cuni.cz/studium/predmety/index.php?do=download&did=130405&kod=JPM902>.

Conflict between technology and critical infrastructure

In its “Elements for a new EU strategy on China,” the European Commission states that “Ambitious initiatives such as ‘Made-in-China 2025’ and the related ‘Internet +’ action plan underline the importance that China attaches to the digital economy as well as its transformative potential for sectors such as manufacturing.”¹³ From this understanding, the EU recognises that it benefits “[...] from strengthening **research and innovation** cooperation with China by jointly developing knowledge and technology, tapping into China’s talent pool [...]”¹⁴

The USA rates China highly as a technological power, which is reflected in recent statements by the Biden administration. This goes hand in hand with President Biden’s political demand that the USA must, “[...] take back the leading position from China [note: in the electric mobility sector].”¹⁵ With regard to electric mobility, the US president states, “They [note: China] are not going to win this race. We can’t let them do that.”¹⁶ According to the online technology magazine Golem, President Biden is convinced that 80 per cent of the production capacity for batteries for electric vehicles is located in China and “[...] Chinese companies are also targeting the USA.”¹⁷ China’s global expansion initiatives also hit Europe. For example, already in 2019, the magazine *Der Spiegel* reported on the Chinese corporation CATL wanting to build the largest factory for e-car batteries in Europe in Germany, which the German Federal Minister of Research described as “[...]”

¹³ European Commission, High Representative of the Union for Foreign Affairs and Security Policy, “Joint Communication to the European Parliament and the Council. Elements for a new EU strategy on China,” Brussels, June 22, 2016, JOIN (2016) 30 final, 9,

https://eeas.europa.eu/archives/docs/china/docs/joint_communication_to_the_european_parliament_and_the_council_-_elements_for_a_new_eu_strategy_on_china.pdf.

¹⁴ Ibid.

¹⁵ The original quotation reads: “China die Spitzenposition [Anm.: in der Industriesparte der Elektromobilität] wieder abnehmen.” Golem.de, “Die elektrische Zukunft soll den USA gehören, nicht China,” <https://www.golem.de/news/joe-biden-die-zukunft-des-autos-ist-elektrisch-2105-156600.html>, May 19, 2021, dpa/Werner Pluta.

¹⁶ Ibid. The original quotation reads: “80 Prozent der Produktionskapazitäten bei Akkus für Elektrofahrzeuge lägen in China.”

¹⁷ Ibid. The original quotation reads: “[...] chinesische Unternehmen hätten auch den US-Markt im Visier.”

existential issue [...].”¹⁸ The consulting firm Benchmark Mineral Intelligence reports that 46 of the 70 or so gigafactories under construction worldwide are in China.¹⁹

China is even active in infrastructure projects, such as a bridge construction project in Croatia, or with investments in Portugal’s electricity supply.²⁰ “That’s how it works all over Europe. Railway lines, ports and power grids, mechanical engineering, tourism and finance – Chinese companies are buying into the European economy in all these sectors. They have already invested far more than 300 billion euros here.”²¹ In 2016, the “[...] Chinese household appliance group Midea bought the German robotics manufacturer Kuka for 4.6 billion euros.”²² The narrative of an increasingly Chinese threat has clearly taken root.

The statement in the *Economist* about how China’s “[...] huge investments abroad give it a sharp power” which it uses to “[...] silence critics [...]”²³ The *Tagesspiegel* quotes a leading functionary of the EU industry lobby, according to which “The Chinese state-owned companies have unlimited financial power with the state treasury behind them, this is not fair competition.”²⁴ Furthermore, the German industry association BDI warned that the “Chinese economic model had a strong state influence.”²⁵ Thus, the

¹⁸ The original quotation reads: “existenzielles Thema,” Alexander Jung, “Akkus für Millionen,” *Der Spiegel*, Nr. 8/February 16, 2019, 55.

¹⁹ Ibid.

²⁰ Schmidt, “Wie gefährlich China für Europa wirklich ist,” *Tagesspiegel*, September 15, 2019, <https://www.tagesspiegel.de/gesellschaft/investor-partner-konkurrent-wie-gefaehrlich-china-fuer-europa-wirklich-ist/25014924.html>.

²¹ Ibid. The original quotation reads: “So läuft das europaweit. Eisenbahnlinien, Häfen und Stromnetze, Maschinenbau, Tourismus und Finanzwesen – in all diesen Branchen kaufen sich chinesische Unternehmen in die europäische Wirtschaft ein. Schon weit mehr als 300 Milliarden Euro haben sie hier investiert.”

²² Ibid. The original quotation reads: “[...] als der chinesische Hausgerätekonzern Midea für 4,6 Milliarden Euro den deutschen Robotik-Hersteller Kuka kaufte.”

²³ The original quotation reads: “riesige Investitionen im Ausland verschaffen ihm eine scharfe Macht, die es nutze, um Kritiker mundtot zu machen,” *Economist*, cited in Schmidt, “Wie gefährlich China für Europa wirklich ist.”

²⁴ The original quotation reads: “Die chinesischen Staatskonzerne verfügen mit der Staatskasse im Rücken über eine unbegrenzte Finanzkraft, das ist kein fairer Wettbewerb,” Schmidt, “Wie gefährlich China für Europa wirklich ist.”

²⁵ Ibid.

EU perceives hybrid threats from China primarily in the economic sphere, especially in the area of investment. The European response was the decision to adopt the “Regulation Establishing Framework for the Screening of FDI into the Union”²⁶ (March 19, 2019), a complement to Brussels’ China strategy²⁷ (March 12, 2019). Since then, the EU’s priority demand to Chinese negotiating partners has been transparency and reciprocity.

The importance of space research and technology for environmental and climate problems and their solutions can be seen in solar cell technology. The latter promises to make a significant contribution in fighting the climate crisis. Solar cells are an essential component of satellites and spaceships, and China has global leadership in this sector. Chinese space research could help this technology to take a further leap forward in terms of efficiency, product weight and cost minimisation.²⁸

High-tech products not only reinforce strategic power projections internationally but also national resilience against external hybrid threats. Technologies in key industries, such as cloud computing and big data increase the vulnerability of our society to hybrid threats.²⁹ From China’s perspective, the “next-generation information technologies” will be the Internet of Things, cloud computing and big data.³⁰ The industries of the future are also predicted to be “[...] micro-system, nanotechnology, advanced manufacturing, human-computer interaction [...]”³¹

²⁶ Official Journal of the European Union, March 21, 2019, L 79 I/1, <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32019R0452&from=EN>.

²⁷ European Commission, “EU-China – A strategic outlook,” in *European Commission and HR/VP contribution to the European Council*, March 12, 2019, <https://ec.europa.eu/info/sites/default/files/communication-eu-china-a-strategic-outlook.pdf>.

²⁸ TNW, “Why we need to colonize Mars as soon as possible,” <https://thenextweb.com/news/why-we-need-to-build-colonies-mars-now-syndication>, published May 10, 2021, originally published by James Maynard, *The Cosmic Companion*.

²⁹ European Commission, “Joint Framework on countering hybrid threats,” 11.

³⁰ Gu, “Chinas Aufstieg zur Weltmacht?”

³¹ Ibid.

China's technological market power is evident from export data, especially with regard to electronics. A slightly outdated but nicely structured table from 2019 shows that China has a share of 27.49 per cent in global electronics exports. The superiority becomes clear from a comparison to runner-up Taiwan, with a share of 6.77 per cent. The entire Asian region exported over 64 per cent of all electronics.³²

Export figures are not the only evidence of China's geopolitical claim to leadership. Other indicators of the market power ambition are patent applications. Data from the European Patent Office from 2019 illustrate the Chinese push. For example, with "[...] 3,524 [...] patents the Chinese telecommunications company Huawei [...] applied for more patents than any other company in Europe [...]"³³ Market power can also be gained through standards and "China is consistently working to enforce its own technological standards, thus determining future framework conditions for international companies."³⁴

Outer Space Initiatives

According to an EU document, China "[...] is seeking a bigger role and exerting greater influence on an evolving system of global governance."³⁵ Outer Space is not exempt from this as it is becoming increasingly important in terms of security policy. Not only because of the solar technology mentioned above. The question of defence capabilities is increasingly coming to the fore in the area of Outer Space. "Defence capabilities need to be strengthened in order to enhance the EU's resilience to hybrid threats. It is important to identify key capability areas, e.g. surveillance and

³² Due to the COVID-19 situation, comparative presentations of more recent export data are deliberately dispensed with.

³³ The original quotation reads: "mehr Patente angemeldet als jedes andere Unternehmen in Europa [...] 3524," Stephan Scheuer, *Der Masterplan. Chinas Weg zur Hightech Weltherrschaft*, Herder, Freiburg im Breisgau 2018, Erweiterte und aktualisierte Taschenbuchausgabe 2021, Kindle Version, 10.

³⁴ The original quotation reads: "China arbeitet konsequent daran, eigene technologische Standards durchzusetzen und bestimmt so künftige Rahmenbedingungen für internationale Unternehmen MERICS (Mercator Institute for Chinas Studies), "Chinas digitaler Aufstieg", April 8, 2019, short version, <https://merics.org/de/studie/chinas-digitaler-aufstieg>.

³⁵ European Commission, "Joint Communication," 2.

reconnaissance capabilities.”³⁶ Above all, “[...] Public-Private Partnership and accompanying measures will primarily focus on civilian products and services, the outcome of these initiatives should allow technology users to be better protected also against hybrid threats.”³⁷

Current Chinese space successes show China’s technical capability and great power ambition. In particular, the progress in Outer Space in 2021, the successful landing of the rover Zhurong on Mars (May 2021), and the positioning of the main module of the Chinese space station Tiangong in LEO³⁸ (April 2021), testify to the country’s ambitions and self-image of wanting to take a leading role in space travel. China’s efforts in the field of space exploration are manifold.

As early as in 2018, the Chinese National Defence University of the People’s Liberation Army provided insights into a “Space Situational Assessment and Space Governance”³⁹ in an essay titled “International Strategic Relations and China’s National Security.” “At present, space development is viewed as a top strategic priority by major powers in the world.”⁴⁰ Guoying Chen thus points to the strategic importance and future political influence of space technologies. The USA, Russia, Europe (especially France, Italy, and the United Kingdom), Canada, Japan, South Korea, and India are particularly committed. Chen draws on investment data from the Space Foundation and its 2016 Space Report. The implicit logic is that China’s space ambitions are merely a catch-up process and, therefore, justified. China sees itself as a “rising star”⁴¹ in space exploration. The increased importance of Outer Space research is reflected in investments. For example, the “Space Foundation” states that “the global space economy grew in 2019 to \$423.8 billion [...]”,⁴²

³⁶ Ibid., 9.

³⁷ Ibid., 11.

³⁸ Low Earth Orbit (LEO).

³⁹ Institute for Strategic Studies, National Defence University of Peoples’ Liberation Army, China, *International Strategic Relation and China’s National Security*, Vol. 3, Chen Guoying, “Space Situational Assessment and Space Governance,” World Scientific, Singapore, 2018, 291-312.

⁴⁰ Ibid.

⁴¹ Ibid.

⁴² Space Foundation, Global Space, <https://www.spacefoundation.org/2020/07/30/global-space-economy-grows-in-2019-to-423-8-billion-the-space-report-2020-q2-analysis-shows/>.

increasing by more than “[...] \$9 billion over the previous year [...]”.⁴³ In terms of emphasis, the following research fields emerge: launch vehicles, communication and earth observation satellites, development of new rocket propulsion systems. The Chinese study also predicts an enormous surge in the development of small satellites (so-called smallsats).⁴⁴

China’s increasing focus on the narrative of a great space nation becomes obvious through various activities. For example, Beijing is committed to a “Regional Centre for Space Science and Technology Education, affiliated with the United Nations and hosted at existing research and higher education institutions around the world.”⁴⁵ This makes China a supporter of space education and training, alongside India, Jordan, Mexico/Brazil, Morocco and Nigeria. The goals of the centre are “[...] to develop the skills and knowledge of university educators, scientists and government officials through rigorous theory, research, applications, field exercises, and pilot projects regarding aspects of space science and technology that can contribute to sustainable development.”⁴⁶ According to the UN report, Beijing maintains the Regional Centre for Space Science Technology Education in Asia and the Pacific (RCSSTEAP) with three master’s programmes. Focal points are Satellite Communication and GNSS, Remote Sensing and Geo-Information Systems, and Micro-satellite Technology. The latter, in particular, reveals an interest in the development of micro-satellites. A doctoral programme for Space Technology Applications completes the university programme. Furthermore, UNOOSA, and CNSA signed a Memorandum of Understanding to expand cooperation with the international community, for mutual access to research data from China’s lunar and space research to promote technological opportunities and scientific progress. This is in line with UNOOSA’s guiding principle of making all the benefits of space exploration available to all humankind. Increased competition with other space research nations for the best minds and ideas has opened up.

⁴³ Ibid.

⁴⁴ Institute for Strategic Studies, *International Strategic Relation*.

⁴⁵ UN Office for Outer Space Affairs (UNOOSA), Annual Report 2019, Vienna, 2020, 49, https://www.unoosa.org/res/oosadoc/data/documents/2020/stspace/stspace77_0_html/UNOOSA_Annual_Report_2019.pdf.

⁴⁶ Ibid.

On the legislative level, differences between the USA and China are particularly evident in the interpretation of the UN General Assembly's Outer Space Treaty 222 (XXI), the article on "[...] peaceful exploration and use of Outer Space, including the Moon and other celestial bodies, and the importance of developing the rule of law in this new area of human endeavour [...]."⁴⁷ China's criticism refers primarily to the US Commercial Space Launch Competitiveness Act (HR 2262), which was confirmed by the US Senate in 2015. This law aims to "[...] facilitate a pro-growth environment for the developing commercial space industry by encouraging private sector investment [...]."⁴⁸ The Act provides that "[...] [a]ny asteroid resource or space resource obtained, including to possess, own, transport, use, and sell the asteroid or space resource obtained in accordance with applicable law, including the international obligations."⁴⁹ What is special about this is that the "[...] language that defines property rights is designed to get around the provision of the [...]"⁵⁰ Outer Space Treaty, including the moon, and is not subject to national appropriation by claim of sovereignty, by means of use or occupation, or by any other means."⁵¹ This would legalise the mining of ores on the moon, asteroids or planets, at least from the US point of view, which for China would violate UN provisions on the use of Outer Space. China therefore protested, underlining once again its narrative of a responsible great power. However, China's goal to establish a permanent manned station on the South Pole of the moon by 2029 and becoming the leading space nation should not be forgotten.⁵² It would give China control

⁴⁷ UNOOSA, Resolution adopted by the General Assembly, 2222 (XXI). "Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies,"

<https://www.unoosa.org/oosa/en/ourwork/spacelaw/treaties/outerspacetreaty.html>.

⁴⁸ Kasey Tuttle, *JURIST, legal News & Commentary*, "Senate approves Bill to legalize Space mining," November 13, 2015, <https://www.jurist.org/news/2015/11/senate-approves-bill-to-legalize-space-mining/>.

⁴⁹ H.R.2262 - U.S. Commercial Space Launch Competitiveness Act, PUBLIC LAW 114–90—November 25, 2015, § 51303. "Asteroid resource and space resource rights," 129 STAT. 721, <https://www.congress.gov/114/plaws/publ90/PLAW-114publ90.pdf>.

⁵⁰ Tuttle, "Senate approves Bill."

⁵¹ UNOOSA, "Treaty on Principles Governing the Activities of States."

⁵² Robert Klatt, *Forschung und Wissen*, "China plant Eröffnung einer bemannten Station auf dem Mond,"

<https://www.forschung-und-wissen.de/nachrichten/astronomie/china-plant-eroeffnung-einer-bemannten-station-auf-dem-mond-13372894>.

of a small territory on the Earth's natural satellite, although possession is prohibited under the UN Moon Treaty. Only partner nations could participate.

A geopolitical competition for partners for space research has begun and manifested itself in the form of various agreements and alliances.

Already in 2017, Roscosmos and CNSA signed a joint space programme for the period 2018-2022. The six-chapter programme includes “[...] the study of the Moon and deep space, space research and related technologies, satellites and their use, the components base and materials, cooperation in the data of Earth's remote sensing and other issues.”⁵³ On April 9, 2021, the cooperation agreement was extended by a Memorandum of Understanding (MoU) on the construction of an International Scientific Lunar Station (ISLS). “Outer Space is an important dimension of the relationships of comprehensive mutually advantageous cooperation between Russia and China where significant progress has been achieved in recent years,”⁵⁴ said the Chinese Foreign Ministry spokesperson Wang Wenbin in a press conference on April 27, 2021.

To underline the inclusive nature of bilateral space ambitions, the prospect of a “[...] roadmap for building the moon station, work closely in planning, design, implementing and operations of the station, which also includes promoting the project to the international aerospace community”⁵⁵ were envisioned.

The USA already signed the Artemis Accords with eight states in November 2020,⁵⁶ thus forming a geopolitical alliance of interests. The aim is to agree on “[...] principles governing norms of behaviour for those who want to

⁵³ TASS, Russian News Agency, <https://tass.com/science/1283825>, see also Deng Xiaoci, “China, Russia emphasize international cooperation in establishing lunar station with joint declaration,” April 24, 2021, <https://www.globaltimes.cn/page/202104/1221931.shtml>.

⁵⁴ TASS, Russian News Agency.

⁵⁵ Deng Xiaoci, “China, Russia ink MOU on building international scientific research station on moon: CNSA,” March 9, 2021, <https://www.globaltimes.cn/page/202103/1217875.shtml>.

⁵⁶ Australia, Canada, Italy, Japan, Luxembourg, the UAE and Great Britain.

participate in the Artemis lunar exploration program.”⁵⁷ Russia – unlike China – was invited to participate, but Dmitry Rogozin described the programme as too “U.S.-centric.”⁵⁸ This makes it evident that those who have dominance in the respective space programme also defend their own interests against partners. This would confirm the strategic importance of such concepts.

Thus, the aforementioned cooperations do not only reveal the openly fought competition for cooperation partners, but also the formation of two pragmatic strategic space research alliances/blocs with, for the time being, Russia and China on the one hand, and the USA with Western partners, including Australia and Japan, on the other hand. If Europe wants to continue to play a role in space research and participate in the boom of space technology research, the following alternatives arise:

- It joins one of the blocs.
- It finds a diplomatic solution to cooperate with both research blocs.
- It finds its own alternative to the competing blocs, which will hardly be financially feasible.

The formation of an alliance is particularly controversial because after 20 years, the guarantee of existence of the International Space Station (ISS) expires in 2024, an urgent replacement is imminent, and no Western-style alternative is available in the medium term. The head of the Russian space agency, Dmitry Rogozin, admitted on a radio station that it should be started as soon as possible.⁵⁹ The possibility of space tourism should be considered, he said.

With its current unmanned space station Tiangong 2, which is modelled on the ISS, China has come very close to this goal and Rogozin’s ideas. China would then be the only space-faring nation with a manned station in orbit. China’s underlying motivation is manifold: “[...] to conduct scientific

⁵⁷ Jeff Foust, “Eight countries sign Artemis Accords,” SpaceNews, October 13, 2020, <https://spacenews.com/eight-countries-sign-artemis-accords/>.

⁵⁸ Ibid.

⁵⁹ Wiener Zeitung, “Russland erwägt Bau einer neuen Weltraumstation,” May 25, 2020, <https://www.wienerzeitung.at/nachrichten/wissen/technologie/2061743-Russland-erwaegt-Bau-einer-neuen-Weltraumstation.html>.

research and make medical, environmental, and technological discoveries” but also, e.g., “[...] commercial gains and prestige.”⁶⁰

China is making an important contribution by providing generous financial support⁶¹ (alongside Germany) to the UN-SPIDER programme,⁶² within the framework of UNOOSA (UN Office for Outer Space Affairs). This will enable nations to use “[...] space data and technologies, such as satellite imagery, to prevent and manage disasters.”⁶³ Thus, the potential international cooperation area of Outer Space will make a significant contribution to conflict management. This will affect all those states that participate in peacekeeping missions worldwide – such as China or also Austria. In general, this underlines China’s narrative as a responsible great power.

UNOOSA and the China Manned Space Agency (CMSA) called for a competition in which the winners would be given the opportunity to conduct experiments for research purposes on the China Space Station (CSS), which will be operational in 2022. Nine winning teams were selected from within 42 applicants from 27 countries. The teams are made up of participants from 17 countries, including European countries.⁶⁴ The submitted projects were carefully evaluated by 60 experts from UNOOSA, CMSA, and the international space community. What remained were the most interesting and promising ones from the disciplines “[...] space medicine, space life science, biotechnology, microgravity fluid physics, microgravity combustion, astronomy, and space technologies.”⁶⁵

It is not to be expected that the “Middle Kingdom” will leave the above-mentioned research fields only to other states. In accordance with the goals of the 14th Five-Year Plan, it will vehemently push research as well as education and training. The Chinese position paper for a United Nations

⁶⁰ TNW, “China may gain a monopoly on space stations – but that doesn’t have to be bad news,” published May 18, 2021, <https://thenextweb.com/news/china-tiangong-may-gain-a-monopoly-on-space-stations-syndication>

⁶¹ UNOOSA, Annual Report 2019.

⁶² UN-SPIDER is a United Nations Platform for Space-based Information for Disaster Management and Emergency Response (UN-SPIDER).

⁶³ UNOOSA, Annual Report 2019.

⁶⁴ Ibid.

⁶⁵ Ibid.

General Assembly is worth noting. In it, China emphasises its peaceful approach to Outer Space, especially the prevention of an arms race. China is convinced that it “[...] has played an active part in the work of the UN Committee on the Peaceful Uses of Outer Space. It advocates fair and equitable rules governing Outer Space to realise the vision of a community with a shared future in the peaceful exploration and use of Outer Space,”⁶⁶ thus revealing China’s moral narrative.

The exploration of deeper space is generally expected to provide a new impetus for various space technologies. The primary goal remains the manned flight to Moon and Mars.

Financing space ambitions

Space tourism is predicted to make a considerable breakthrough. Now that a flight including a stay on the ISS is already possible for a small number of interested parties (at a cost of about USD 50 million⁶⁷), this will be made possible in future for a somewhat broader mass of wealthy investors in coordinated phases. Initially, a kind of space glider will take passengers to an altitude of 100-130 km, allow two to four minutes of weightlessness, and then return to Earth. The company “China Academy of Launch Vehicle Technology (CALT)” develops such spacecraft. “CALT is Chinese state-owned but operated by contract companies and has about 27,000 employees in several research labs.”⁶⁸ Western competition in this field comes from companies owned by Jeff Bezos and Richard Branson.⁶⁹

⁶⁶ People’s Republic of China, “China and the United Nations,” Position Paper of the People’s Republic of China, For the 74th Session of the United Nations General Assembly, translation, 1-10.

⁶⁷ Frankfurter Allgemeine Zeitung (FAZ), “Die Eroberung des Alls läuft auf Hochtouren,” updated December 29, 2020, <https://www.faz.net/aktuell/wirtschaft/digitec/raumfahrt-missionen-die-ganze-welt-will-ins-all-17122540.html>.

⁶⁸ The original quotation reads: “CALT ist in chinesischem Staatseigentum, wird aber durch Vertragsfirmen betrieben und hat rund 27.000 Angestellte in etlichen Forschungslaboren,” Ingenieur.de, “China plant weltgrößtes Raumschiff für 20 Weltraumtouristen,” October 10, 2016, <https://www.ingenieur.de/technik/fachbereiche/raumfahrt/china-plant-weltgroesstes-raumschiff-fuer-20-weltraumtouristen/>.

⁶⁹ Ingenieur.de, “China plant weltgrößtes Raumschiff.”

In a further stage of development, it will be possible to orbit the earth for several days in a spaceship. Billionaire Jared Isaacman “[...] has bought a rocket ride to orbit from SpaceX.”⁷⁰ Three selected people will accompany him.

The next step in space tourism is a trip to the ISS, which is currently being planned. A private company offers space flights. “Axiom serves to expand access to Earth’s orbit to more governments, to private individuals, and to a diverse collection of researchers, product developers, and companies.”⁷¹ The trip will cost each of the four passengers \$55 million, the costs for the fourth traveller, a former Israeli fighter pilot, being borne by Israel. “The tourist flights at the Axiom company are already well booked for years [...],” with the company wanting to “[...] attach three of its own modules to the American part of the space station”⁷² in the future. This venture could fail when the ISS ends its life cycle in 2024. It is doubtful whether a private company will dock cost-intensive modules to the ISS for only about two to three years. The Chinese space station could possibly use this business model. Russia has already used Soyuz rockets to bring “space tourists” to the ISS, which represented “[...] an important source of income.”⁷³ A similar motive for approximately covering the costs of space ambitions is likely to prevail with regard to future missions. The visionary Elon Musk is setting further goals and would like to use his “Starship” spacecraft, which is currently being tested, for the first private moon mission. At least one interested party has already been found.⁷⁴

⁷⁰ Kenneth Chang, “A Billionaire Names His Team to Ride SpaceX, No Pros Allowed,” *New York Times*, published March 30, 2021, updated May 2, 2021, <https://www.nytimes.com/2021/03/30/science/30spacex-inspiration4.html>.

⁷¹ Axiom Space, “What are the limits of innovation and exploration?,” <https://www.axiomspace.com/human-spaceflight>.

⁷² The original quotation reads: “Die touristischen Flüge beim Unternehmen Axiom sind bereits auf Jahre gut ausgebucht,” wobei die Firma künftig “drei eigene Module am amerikanischen Teil der Raumstation anbringen will,” Christoph Seidler, “Luxushotel im Erdorbit”, *Der Spiegel*, 17/2021, April 24, 2021, 98.

⁷³ Ibid., The original quotation reads: “eine wichtige Einnahmequelle” Christoph Seidler, “Luxushotel im Erdorbit”.

⁷⁴ SpaceX, Starship, <https://www.spacex.com/vehicles/starship/>.

The competition for financially strong passengers is open. Whoever opens up the market first and best will find it easier to finance their space ambitions. However, with new sources of income to finance space travel, questions also arise about the newly opened-up spaces.

Military use of space

In addition to commercial uses of space, military uses of space are increasingly taking shape. For example, the space tourism described above opens up further challenges, some of which are not without their own concerns. The larger such space stations are, the more legal questions inevitably arise. Who has sovereign rights in and around this “real estate?” Similar questions will arise for inhabited space stations or prospecting areas on the moon. A frictionless coexistence is hardly to be expected in the long run, especially when it comes to economic advantages in the possible mining of ores/minerals.

The creation of space forces reveals the challenges for security policy. For although “[...] space started off as a strategic domain, today it is very much used for an operational and tactical advantage on the battlefield.”⁷⁵

In 2019, the USA officially established its sixth military branch, the Space Force. President Trump announced in his speech at the time that space was “[...] the world’s newest war-fighting domain” and spoke of “[...] grave threats to our national security,” stating that “American superiority in space is absolutely vital [...]” to the USA.⁷⁶ This military branch is intended to counter possible “threats to the USA in space and from space, such as hostile attacks on US satellites.”⁷⁷ Although the budget for this is small, at \$40 million, it should not be forgotten that the Pentagon funds space research to

⁷⁵ Dr. Kestutis Paulauskas, “Space: NATO’s latest frontier,” *NATO Review*, March 13, 2020, <https://www.nato.int/docu/review/articles/2020/03/13/space-natos-latest-frontier/index.html>.

⁷⁶ BBC News, “Space Force: Trump officially launches new US military service,” December 21, 2019, <https://www.bbc.com/news/world-us-canada-50876429>.

⁷⁷ The original quotation reads: “Bedrohungen für die USA im All und aus dem All abwenden, etwa feindliche Angriffe auf US-Satelliten,” Alwin Schröder, “China wirft Trump ‘Wettrüsten im Weltraum’ vor,” *Spiegel Online*, December 23, 2019.

the tune of \$14 billion a year.⁷⁸ The USA assumes that China and Russia would develop technologies to destroy US satellites.⁷⁹ These technologies have already been developed; the Pentagon expects that in the event of a conflict, China will first cripple the GPS system.

This is particularly noteworthy as exciting technologies are emerging in the rapid development of satellites for armed forces in the areas of “[...] reconnaissance, early warning, communications, and navigation [...]”.⁸⁰ Two US experts estimate that in the future “an opening act in a war between China and the United States for control over the Pacific would take place in space, in order to ‘blind the enemy’.”⁸¹ The narrative on China has taken root in US society: “Hostility against China has been spreading in the US society in recent years.”⁸² Not to be forgotten should be the impact of satellite technology as an economic factor.⁸³

In 2019 “French President Emmanuel Macron [...] had approved the creation of French Space command within the French air force to improve the country’s defence capabilities” and until 2025 it has a “[...] military spending plan that allocates 3.6 trillion (\$4 billion) to defence in space.”⁸⁴

⁷⁸ Julia Stanek, “Amerikas Überlegenheit im Weltraum ist unerlässlich,” *Spiegel Online*, December 21, 2019, <https://www.spiegel.de/politik/ausland/donald-trump-gruendet-weltraumarmee-a-1302454.html>.

⁷⁹ Ibid.

⁸⁰ Institute for Strategic Studies, *International Strategic Relation*.

⁸¹ Paulauskas, “Space: NATO’s latest frontier.”

⁸² Global Times, “China Needs to prepare for continued US provocations: Global Times editorial,” May 8, 2020, <https://www.globaltimes.cn/content/1187788.shtml>.

⁸³ For example, the Beidou satellite positioning system is “...un indéniable instrument d’influence qui occupe une place essentielle dans la construction des routes numériques de la soie. [...] Quoi qu’il en soit, le « corridor d’information spatial des routes de la soie », ainsi dénommé par Pékin, devrait in fine accélérer la partition de la planète en deux zones d’influence, américaine et chinoise.” See also English version (to be published in November 2021). P. Charon et J.-B. Jeangène Vilmer, “Les Opérations d’influence chinoises. Un moment machiavélien,” (Institut de Recherche Stratégique de l’Ecole Militaire) *IRSEM report*, October 2021, Paris, Ministère des Armées, p. 131, <https://www.irsem.fr/rapport.html>.

⁸⁴ France24, “Macron announces creation of French Space force,” Issued on July 13, 2019. Modified: July 14, 2019, <https://www.france24.com/en/20190713-macron-france-space-force>.

Even NATO adopted a space strategy at the end of 2019. “Allied leaders welcomed the recognition of space as a new operational domain [...],”⁸⁵ while preparing for future wars in space. Any conflict “[...] in space would affect all users of space – perpetrators, victims, and bystanders.”⁸⁶ The dimension of Outer Space is shown by its enormous impact on many aspects of security policy. For example, NATO is “[...] increasingly reliant on space for all its missions, activities and operations: collective defence, crisis response, disaster relief and counterterrorism – all depend on information delivered from and through space.”⁸⁷

The example of satellite technology illustrates the fact that technology, space, and military are becoming more and more interconnected. The focus is not only on satellites as reconnaissance technology per se, but especially on their protection against external effects on the artificial satellites. This ranges from external interference with the components to a possible downing.

The race for critical infrastructure in space is not without consequences. At least 50 different nations or multinational organisations own and operate about 2,000 active satellites.⁸⁸ Consequently, more and more space debris from non-functional missiles poses a threat. Accordingly, there is a need for clean-up in space. But the emerging technology for space debris removal could have a dual-use character. Some kind of “satellite kidnapping” is imaginable. Cyber technology will also play a significant part in this.

In a presentation at the University of Hong Kong concerning the topic of space law Chinese lawyer and space law expert Professor Zhao Yun uses a few interesting key phrases,⁸⁹ such as “space as a final frontier,” “regulate space activities,” “binding regulations,” “Outer Space treaty (five space treaties), deal only with the public side of space law,” “no country can claim for sovereignty,” “Outer Space should be preserved for peaceful purposes, no military action should be taken place in Outer Space,” “no military or

⁸⁵ Paulauskas, “Space: NATO’s latest frontier.”

⁸⁶ Ibid.

⁸⁷ Ibid.

⁸⁸ Ibid.

⁸⁹ Five Decades of Space Law: Opportunities and Challenges in the Era of Space Commercialisation. <https://video.law.hku.hk/five-decades-of-space-law-opportunities-and-challenges-in-the-era-of-space-commercialization/>, no time of day.

aggressiveness,” “weapons are possible for not aggressive purposes,” “space commercialization,” “satellites for benefits,” “Russia and China believe we need to think about peaceful use of Outer Space, non-peaceful use should be forbidden.”⁹⁰

Cyber activities

As Guoying Chen’s security policy analysis shows, significant advances in the next generation of information technologies are expected, especially through the space domain and the development of microsatellites. Included are segments, such as “[...] micro-systems, nanotechnology, advanced manufacturing, human-computer interaction [...]”⁹¹ Cyber technology is an essential core element for achieving the goals in the above-mentioned segments. Space and cyber are closely linked, because “cyber threats can impact on each of the segments – software of the satellites, ground control, data links and the user.”⁹² This is precisely where one of the biggest challenges for space technologies lies. Whether China’s rise, “[...] is causing some US political elites to abandon rational thinking”⁹³ remains to be seen. The Chinese statements in the above-mentioned position paper of the 74th General Assembly are noteworthy. Here, China emphasises its active role in UN activities such as education, research, telecommunications, and the internet.

In the future, the United Nations could contribute to easing possible emerging challenges – the UN as a superordinate authority, a hub between the countless actors. They could ensure more transparency, mutual understanding and, thus, peace.

China’s narrative is that it supports “[...] a widely acceptable code of conduct in Cyberspace under the UN framework. It plays a fundamental role in meetings of the UN’s Group of Governmental Experts on Cyber Security and has made important contribution to the consensus building.”⁹⁴ This

⁹⁰ Ibid.

⁹¹ Institute for Strategic Studies, *International Strategic Relation*.

⁹² Paulauskas, “Space: NATO’s latest frontier.”

⁹³ Global Times, “China needs to prepare for continued US provocations.”

⁹⁴ People’s Republic of China, “China and the United Nations,” 1-10.

gives a clear idea of Chinese strategic thinking regarding Cyberspace. Interesting are the different narratives of China and the West. China is accused of being responsible for global cyber-attacks and cyber-espionage, while China officially emphasises its cooperative role.

The cyber sector includes other technologies, such as smartphones or infrastructure, which are indispensable for internet applications. Huawei offers the necessary 5G technology for this. The new communication technology is crucial mainly because “strategic communications are a key element to counter the components of hybrid threats in the information field.”⁹⁵ For the “protection of information is an essential prerequisite to control communications.”⁹⁶ This statement is particularly controversial because the German “[...] Federal Foreign Office [...] according to media reports, sees evidence of cooperation between the Chinese network supplier Huawei and Chinese security authorities.”⁹⁷ In its Strategic Communication Paper⁹⁸ the European Parliament mentions China as often as 66 times as an actor with a relevant power factor. On the one hand, it is seen as a potential threat due to cyber-intelligence, cybersecurity or disinformation. On the other hand, it is regarded as an important trading partner with potential. In this context, China’s rise is perceived as a soft power with increased potential for influence.

The problem with cyber-weapons is that they “[...] cripple power and water supplies of entire states, our transport systems, the financial economy” and that it is “more difficult to identify a cyber-attack than to detect a ballistic

⁹⁵ European Parliament Research Service, Scientific Foresight Unit (STOA), Briefing, *STOA Options Brief*, PE 656.323, March 2021, 1-4, [https://www.europarl.europa.eu/RegData/etudes/STUD/2021/656323/EPRS_STU\(2021\)656323\(ANN1\)_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/STUD/2021/656323/EPRS_STU(2021)656323(ANN1)_EN.pdf).

⁹⁶ Ibid.

⁹⁷ The original quotation reads: “Auswärtige Amt [...] Medienberichten zufolge Beweise für eine Zusammenarbeit des chinesischen Netzwerkausrüsters Huawei mit chinesischen Sicherheitsbehörden,” *Zeit Online, Reuters, dpa, sr*, “Bundesregierung sollen Beweise gegen Huawei vorliegen,” January 29, 2020, <https://www.zeit.de/politik/ausland/2020-01/huawei-5g-ausbau-zusammenarbeit-china-sicherheitsbehoerden>.

⁹⁸ European Parliament Research Service, Scientific Foresight Unit (STOA).

missile.”⁹⁹ The general increased incidence of cyberattacks raises fears that space travel will not be exempt in the future. Enormous political, economic and research-technological setbacks would have to be assumed. Direct ones with partly catastrophic effects on the Earth, e.g. through “space debris” not burning up in the Earth’s atmosphere, cannot be ruled out.

Conclusion

High technology and especially the Outer Space domain – both inextricably linked to cyber – are traded as game-changers of our future. In terms of security policy, however, this future seems to have already arrived. This contradiction has to be viewed ambivalently. On the one hand, space research leads us to expect international cooperation with China, due to the high financial challenges; on the other hand, a battle is being waged in and above Cyberspace. The wish that “[s]pace is a treasure shared by all humanity and an important driving force for global economic development” illustrates China’s pragmatic intention to cooperate and confirms China’s narrative of a morally shaped great power. Development of this cooperation will depend on mutual trust and require intensive and sustained persuasion on the part of all parties. It remains to be seen whether the politically opposing systems will stand in each other’s way.

Due to the conflicting narratives of the actors concerned, smooth solution concepts are not to be expected. In this respect, even openly accessible US security analyses speak a clear language.

“According to the US Department of Defense, the US ‘faces serious and growing challenges to its freedom to operate in space.’ China and Russia, it said, ‘view counterspace capabilities as a means to reduce US and allied

⁹⁹ The original quotation reads: “[...] Strom- und Wasserversorgung ganzer Staaten lahmlegen, unsere Transportsysteme, die Finanzwirtschaft” und es “[...] schwieriger ist, einen Cyberangriff zu identifizieren, als eine ballistische Rakete aufzuspüren,” James Stavridis, former Supreme Allied Commander Europe in a Spiegel interview, Bernhard Zand, *Der Spiegel*, April 17, 2021, “Es wäre naiv zu sagen, China sei kein Problem.” [It would be naive to say that China isn’t a problem.], 86.

military effectiveness’.”¹⁰⁰ China seems to be an indispensable partner for science and research, especially in space travel, thanks to the countless cooperations it is seeking. For smaller Western companies in particular, the question arises how far they are perceived as equal cooperation partners by China and how quickly research results flow into marketable products and who contributes them. China’s commitment to the UN-SPIDER programme in particular, with the “[...] Ministry of Emergency Management of the People’s Republic of China, in collaboration with the Ministry of Foreign Affairs, China National Space Administration (CNSA) and the Asia Pacific Space Cooperation Organization (APSCO)”¹⁰¹ is remarkable. The EU should act with caution here, so that it does not fall behind, due to overly complex legal frameworks and decision-making processes. It will be up to the UN as well as the EU to ensure an appropriate balance.

If China is striving for credible EU cooperation, it must be its goal to take the strongest possible action against any attacks by Chinese hackers emanating from its territory, using all available means. In this regard, the EU has been trying since 2016 to reach a “[...] political agreement with China on combating cyber-enabled theft of IPR [intellectual property rights] and trade secrets.”¹⁰² An agreement between China and the EU should be sought. China would gain credibility.

As a former commander of the NATO Supreme Command in Europe noted, “China spends its money very intelligently and is extremely focused not only on offensive cyber weapons but on its space programme, hypersonic missiles and stealth technology.”¹⁰³ Such strategic actions should always be taken into account.

In order not to put itself at a disadvantage, Europe should also remember the statement of political scientist Kishore Mahbubani from Singapore, who

¹⁰⁰ IISS, *The Military Balance 2020*, February 2020, “The Space Domain: towards a Regular realm of conflict?”, <https://www.iiss.org/publications/the-military-balance/military-balance-2020-book/the-space-domain-towards-a-regular-realm-of-conflict>.

¹⁰¹ UNOOSA, Annual Report 2019.

¹⁰² European Commission, “Joint Communication,” 9.

¹⁰³ The original quotation reads: “China gibt sein Geld sehr intelligent aus und ist extrem fokussiert nicht nur auf offensive Cyberwaffen, sondern auf sein Weltraumprogramm, auf Hyperschallflugkörper und Tarnkappentechnologie,” Stavridis, *Der Spiegel*.

has been proclaiming the “Asian century” for years, that “Western elites need to develop a good understanding of this new era that is emerging forcefully, and work with their own populations to formulate thoughtful and pragmatic policy responses.”¹⁰⁴ This means to live with a China that exists – and not with a China that we wish would exist.¹⁰⁵ The “Chinese dragon” has staying power, i.e. long-term strategy, which must also be the EU’s goal.

¹⁰⁴ Kishore Mahbubani (2018), *Has the West Lost it?*, Penguin Books, 24.

¹⁰⁵ See Fabian Kretschmer, “Der Triumph der ungeliebten Weltmacht,” *Die Presse*, December 31, 2020, 3.