SIP-Talk: Forschungssicherheit – Entstehung, aktuelle Bedeutung und praktische Bedarfe

Mag. Philipp Brugner, BA, cPM
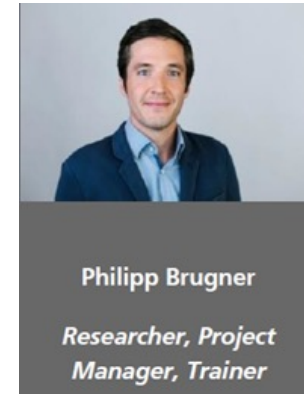
ZSI – Zentrum für Soziale Innovation/ReConnect China (Horizon Europe)

FORWIT

16. Januar 2025, 11:00-12:00

Zum Hintergrund: Die Themen Forschungssicherheit und China am ZSI

Philipp Brugner
Researcher, Project Manager, Trainer

Gábor Szüdi
Researcher, Project Manager, Trainer

- **2025-2027:** Tender participant in the GSF contract on "Assessing contemporary China's R&I ecosystem: EU due diligence for partnering with Chinese research performing organisations" (EC) (TBC)

- **2025-2027:** Tender participant in the GSF contract on ""European R&I Knowledge Network on China 3.0" (EC)

- **2025-2027:** Tender participant in the GSF contract on "Enhancing research security in the EU" (EC)

- **2022-2026:** Horizon Europe ReConnect China: WP leader on impact maximisation and task leader on analysis of EU-China STI cooperation

- **2022-2024:** Tender participant in GSF contract on "European R&I Knowledge Network on China 2.0" (EC)

- **2020-2021:** Tender participant in ISF contract on "European R&I Knowledge Network on China 1.0" (EC)

- **2019:** Austria-China co-publication analysis 2013-2018 (AT)

- **2019-2024:** COST: Individual staff is member of the COST Action CHERN "China in Europe Research Network" (EC)

Was ist „Forschungssicherheit"? Eine Definition der EU

This definition is taken from the Council Recommendation on enhancing research security, published on 24.1.2024, COM(2024) 26 final, 2024/0012 (NLE) by the European Commission
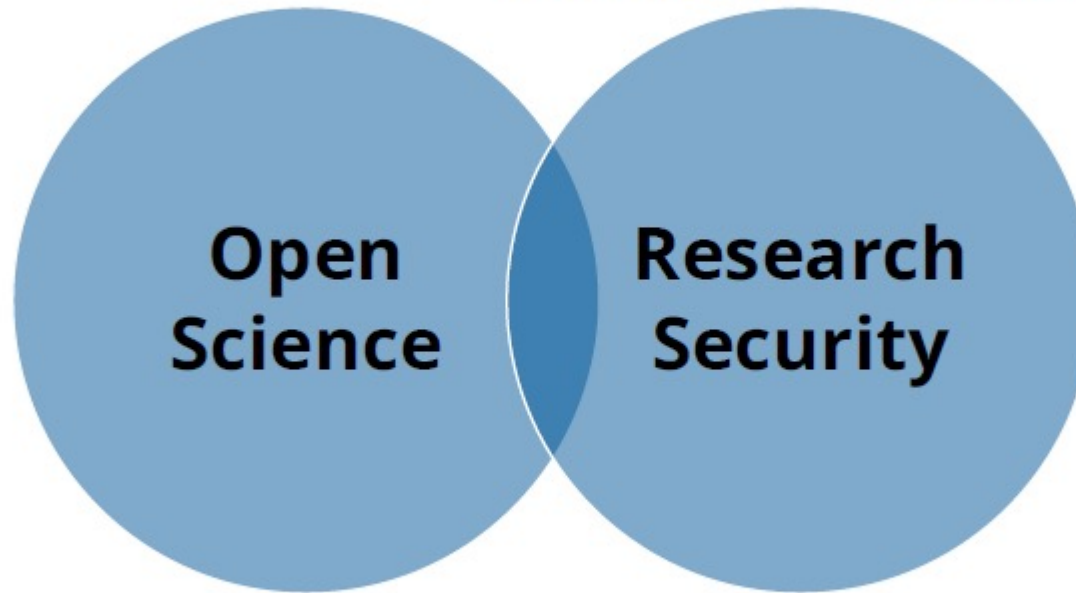
a) the undesirable transfer of critical knowledge, know-how and technology that may affect the security of the EU and its Member States, for instance if channelled to military purposes in third country actors; (*suggestion: "security of individuals, institutions and the EU or its MS)*

b) malign influence on research, where research can be instrumentalised by or from third countries in order to diffuse certain narratives or incite self-censorship among students and researchers infringing academic freedom and research integrity in the EU;

c) ethical or integrity violations, where knowledge and technologies are used to suppress or undermine fundamental values, whether in the EU or elsewhere.

The consideration of 'research security' is an essential component of responsible R&I internationalisation.

Weitere Sichtweisen: USA, G7

Source: US National Science Foundation, Dr. Rebecca Keiser

WARUM FORSCHUNGSSICHERHEIT?

The Economist @TheEconomist · 1d
Xi Jinping hopes that science and technology will help China overtake America. If America wants to retain its lead, it must rethink its strategy econ.st/45rNobd

The Economist
The rise of Chinese science
Welcome or worrying?

SCIENCE|BUSINESS®
Bringing together industry, research and policy

News ▾ Funding Newswire ▾ Reports Events The Network ▾ Communications Services ▾ About Us ▾

The Commission is trying to close Europe's knowledge gap about China. Meanwhile UK and US intelligence agencies warn of Chinese research espionage, and a new report urges universities to brace for a sudden rupture in ties

By David Matthews

RESEARCH COLLABORATION VALUES

1. PURSUING BOLD AND AMBITIOUS RESEARCH TO CHANGE THE WORLD FOR THE BETTER
2. MAINTAINING INDEPENDENCE AND INTEGRITY
3. KEEPING OUR PEOPLE, COLLABORATORS AND RESEARCH PARTICIPANTS SAFE
4. IDENTIFYING AND MANAGING RISKS
5. ENSURING EQUITABLE COLLABORATION AND TRANSPARENT RECOGNITION

INTERNATIONALE POLITIK

Name the subject: Klarer Fokus auf China!

Die Presse
nstag, 18. Juni 2024
Wien 29°C
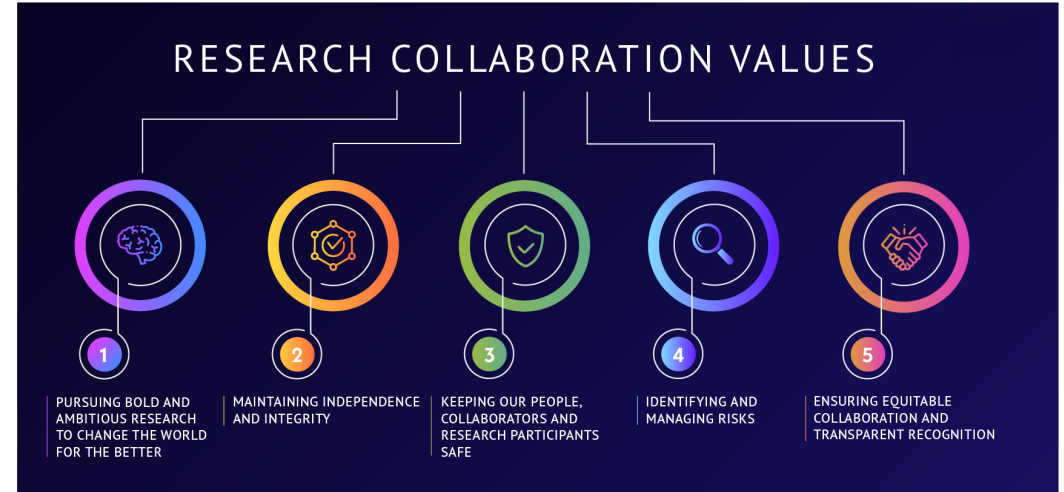NACHRICHTEN MEINUNG MAGAZIN
Ukraine-Krieg Nahost-Konflikt Klimawandel Innenpoli

China: „Europa muss rote Linien definieren"

In welche Richtung soll es gehen? Ein Projekt sucht nach Hinweisen für Kooperationen mit China. Reuters/Tingshu Wang
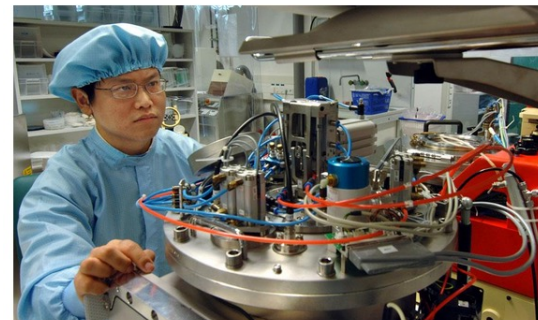
Europa muss neue Wege in den Wirtschafts- und Wissenschaftsbeziehungen mit Peking finden. Die zentrale Frage: Wie lässt sich Kooperation mit Sicherheit in Einklang bringen?

Sebastian Heilmann | Michael Kaschke   29. Apr. 2024

Deutschland ist auf die Zusammenarbeit mit Forschungskräften aus China in den Technik-

European Commission

TACKLING R&I FOREIGN INTERFERENCE

Staff Working Document

Research and Innovation

Chinas sieben „frontier technologies"

Aus dem 14. 5-Jahres-Plan 2021-2025

专栏 2 科技前沿领域攻关
Box 2 Tackling key problems in frontier science and technology

01 新一代人工智能
New generation of artificial intelligence
前沿基础理论突破，专用芯片研发，深度学习框架等开源算法平台构建，学习推理和决策、图像图形、语音视频、自然语言识别处理等领域创新。
Make breakthroughs in advanced basic theories, research and develop dedicated chips, build platforms for open-source algorithms such as deep learning framework, innovate in learning reasoning and decision-making, images and graphics, voice and video, natural language recognition and processing, and other fields.

02 量子信息
Quantum information
城域、城际、自由空间量子通信技术研发，通用量子计算原型机和实用化量子模拟机研制，量子精密测量技术突破。
Research and develop metropolitan, intercity, and free space quantum communication technology, research and produce general quantum computer prototypes and practical quantum simulators and make breakthroughs in quantum precision measurement technology.

03 集成电路
Integrated circuits
集成电路设计工具、重点装备和高纯靶材等关键材料研发，集成电路先进工艺和绝缘栅双极型晶体管（IGBT）、微机电系统（MEMS）等特色工艺突破，先进存储技术升级，碳化硅、氮化镓等宽禁带半导体发展。
Research and develop integrated circuit design tools, key equipment, and key materials such as high-purity targets, make breakthroughs in advanced integrated circuit technology and characteristic processes such as insulated gate bipolar transistor (IGBT) and micro electromechanical system (MEMS), upgrade advanced storage technology, and develop

04 脑科学与类脑研究
Brain science and brain-like intelligence technology
脑认知原理解析，脑介观神经联接图谱绘制，脑重大疾病机理与干预研究，儿童青少年脑智发育，类脑计算与脑机融合技术研发。
Analyze brain cognition principles, map the mesoscopic brain connectome, research mechanisms and interventions for major brain diseases and brain intelligence development of children and adolescents, research and develop brain-like computing and brain

05 基因与生物技术
Genes and biotechnology
基因组学研究应用,遗传细胞和遗传育种、合成生物、生物药等技术创新,创新疫苗、体外诊断、抗体药物等研发,农作物、畜禽水产、农业微生物等重大新品种创制,生物安全关键技术研究。
Research and develop genomics applications, conduct technological innovation in genetic cells and genetic breeding, synthetic biology and biological medicine, research and develop innovative vaccines, in vitro diagnosis and antibody drugs, create new major varieties of crops, livestock and poultry, aquatic products, and agricultural microorganisms, and conduct research on key biosafety technologies.

06 临床医学与健康
Clinical medicine and health
癌症和心脑血管、呼吸、代谢性疾病等发病机制基础研究，主动健康干预技术研发，再生医学、微生物组、新型治疗等前沿技术研发，重大传染病、重大慢性非传染性疾病防治关键技术研究。
Conduct basic research on the pathogenesis of cancers and cardiovascular, cerebrovascular, respiratory, and metabolic diseases, conduct R&D on active health intervention technology and pioneering technologies such as regenerative medicine, microbiome, and new treatment, and conduct research on key technologies for prevention and treatment of major infectious diseases and major chronic non-infectious diseases.

07 深空深地深海和极地探测
Deep space, deep earth, deep sea, and polar explorations
宇宙起源与演化、透视地球等基础科学研究，火星环绕、小行星巡视等星级探测，新一代重型运载火箭和重复使用航天运输系统、地球深部探测装备、深海运维保障和装备试验船、极地立体观监测平台和重型破冰船等研制，探月工程四期、蛟龙深海二期、血龙探极二期建设。
Conduct research on the origin and evolution of the universe, deep earth and other areas of basic science and technology, make inter-planetary explorations such as the Mars orbit and asteroid inspection, develop a new generation of heavy carrier rockets and reusable space transportation systems, deep earth exploration equipment, deep sea operation and maintenance support and equipment test ships, three-dimensional polar observation and monitoring platforms and heavy icebreakers, and push ahead with the lunar exploration project (Phase IV), Jiaolong deep sea project (Phase II), and Xuelong polar exploration project (Phase II).

'Seven Sons of National Defence' (国防七子)

1. Beihang University in Haidian, Beijing

2. Beijing Institute of Technology in Haidian, Beijing

3. Harbin Engineering University in Harbin, Heilongjiang

4. Harbin Institute of Technology in Harbin, Heilongjiang

5. Nanjing University of Aeronautics and Astronautics in Nanjing, Jiangsu

6. Nanjing University of Science and Technology in Nanjing, Jiangsu

7. Northwestern Polytechnical University in Xi'an, Shaanxi

Ministry of Industry and Information Technology

Among China's best funded universities

National University of Defense Technology

Central Military Commission of China

POLITICO

han election   War in Ukraine   French political crisis | Newsletters   Podcasts   Poll of Polls   Policy news   Event

NEWS > TECHNOLOGY

China's military is tapping into EU-funded research

Ties with high-risk Chinese universities come at an awkward time for the bloc.

SHARE

POLITICOPRO   Free article usually reserved for subscribers

The EU has funded at least 14 projects for €26 million that worked with Chinese universities deemed "high-risk". | iStock

JUNE 27, 2024 5:59 PM CET

'Seven Sons of National Arms Industry'

1. Beijing Institute of Technology in Haidian, Beijing

2. Changchun University of Science and Technology

3. Chongqing University of Technology

4. Nanjing University of Science and Technology

5. North University of China

6. Shenyang Ligong University

7. Xi'an Technological University

Previously sub-ordinated to Ministry of Ordnance Industry (until 1986)
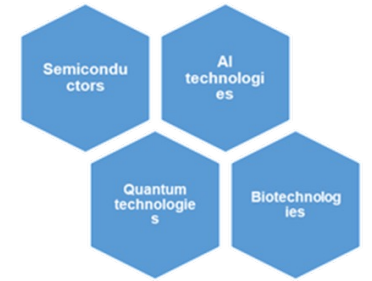
Current governance: ?

Die Entwicklung in China

- Leading universities (e.g. Beijing University, Tsinghua University, Fudan University, Tongji University) sign agreements with SASTIND (State Administration for Science, Technology and Industry for National Defense) to jointly construct defence-related universities

- Difficult to find data, but 38 agreements were signed alone in 2016

- Objective: To establish defence research laboratories at civilian universities (which has led to a large number of defence laboratories already), including three types (top-laboratories with high funding and prestige)

- Largest push to integrate universities in the defence research system since China's reform and opening as of 1978
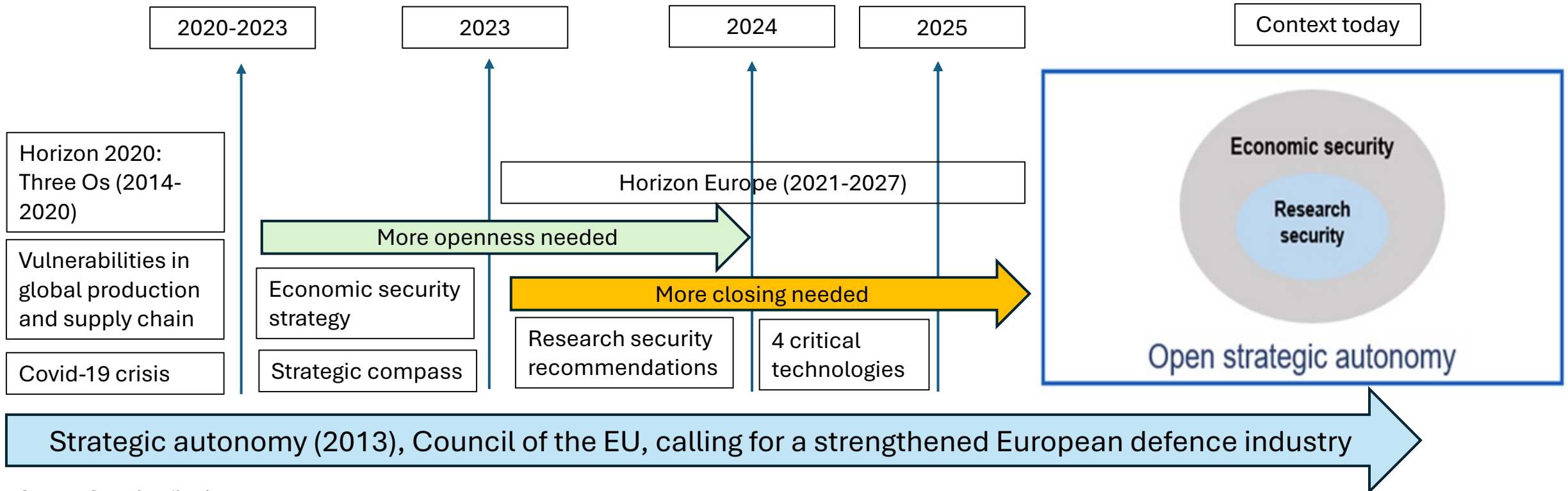
Dokumentenanalyse – wo taucht das Thema auf?

Year	Organisation	Title of document	Mentioned?
2020	European Commission	*Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions*	no
2021	European Council	*Global approach to Research and Innovation – Europe's strategy for international cooperation in a changing world*	no
2022	European Council	*Principles and values for international cooperation in research and innovation*	no
2022	European Commission	*Defence of Democacy initiative*	no
2022	European Commission	*Tackling R&I Foreign Interference*	no
2023	European Council	*Knowledge security and responsible internationalisation*	yes
2023	European Council	*Strategic Compass*	no
2023	European Commission	*Joint Communication to the European Parliament, the European Council and the Council on „European Economic Security Strategy"*	yes
2024	European Commission	*Proposal for a Council Recommendation on enhancing research security*	yes
2024	European Commission	*White Paper on options for enhancing support for research and development involving technologies with dual-use potential*	yes

Von strategisch zu offen-strategisch?

→ Die vier kritischen Technologien

| 2020-2023 | 2023 | 2024 | 2025 | | Context today |

Horizon 2020: Three Os (2014-2020)

Vulnerabilities in global production and supply chain

Covid-19 crisis

Economic security strategy

Strategic compass

Horizon Europe (2021-2027)

More openness needed

More closing needed

Research security recommendations

4 critical technologies

Economic security

Research security

Open strategic autonomy

Strategic autonomy (2013), Council of the EU, calling for a strengthened European defence industry

Source: Own visualisation

Was ist dasselbe, und was nicht?

- Research Security ≠ Securitisation of Research
- Knowledge Security ≠ Research Security
- **Securitisation of Research**: „Research is increasingly framed by security concerns and is becoming a security concern itself, although the implications are not readily acknowledged" (Peter, Strazzari, 2016)
- **Research Security** is about these implications: „Extraordinary means and procedures are invoked in the name of security" (Peter, Strazzari, 2016)
- **Duty of care:** legal obligation that is imposed on an individual, requiring adherence to a standard of reasonable care to avoid careless acts that could foreseeably harm others, and lead to claim in negligence
- **Due Diligence:** Stemming from the business sector, this concept more and more appears also in science: a close perusal of the individual or institution targeted for cooperation (criteria: objectives, strategy, ethics, integrity and risks)

Wo platziert sich die Forschungssicherheit in der internationalen Kooperation?

Interest-driven systems

Science-technology

Policy

Economy

Society

Open science, academic freedom, institutional autonomy, international cooperation, VIE-driven research approach (values, integrity, ethics)

Research Security

Science under order of command

Interest-driven systems

Science-technology

Policy

Economy

Society

The systems we call „Western"

The systems we call „non-Western" or „competitive"

SPOILER: OVERSIMPLIFIED!

Source: own graphic

Scientific excellence only possible with cooperation

Welche öffentlichen Quellen zur Risikoabschätzung gibt es (und können für die Analyse von Kooperationsdaten von F&I-Einrichtungen verwendet werden)?

- Australian Strategic Policy Institute - China Defence Universities Tracker (ASPI/Australia)

- Iran Watch: Tracking Iran's unconventional weapon capabilities (Wisconsin project on nuclear arms control/USA)

- Safeguarding Science: Advocating for the safeguarding of knowledge (DLR/Germany), beinhaltet die folgenden Tools: E-Learning-Kurs, OPERATE-Applikation, OSINT-Materialien

- Vielzahl an US-Trackern zu China sind in kurzer Zeit aufgekommen (dataabyss.ai)

- Schwierig, solche öffentlichen Services zu Türkei, Indien, Russland, Pakistan, Irak zu finden
  ABER: Die Regierung Kanadas hat ein Dokument ("Named Research Organisations")
  veröffentlicht (01/2024), in dem alphabetisch alle Institutionen mit a) militärischen
  b) verteidigungsrelevanten oder c) staatssicherheitsdienstlichen Verbindungen gelistet
  sind → nur Institutionen aus China, Russland, Iran vertreten

Ergebnisse aus unserer Umfrage in Österreich

P. Brugner, G. Szüdi (2024): „ReConnect China Policy Brief 12:

Knowledge and Perception of Research Security – the case of research

cooperation berween Austria and China", LINK

0%

Sprache: Deutsch - Deutsch ▾   Sprache ändern

Forschungssicherheit mit China

Im Rahmen des Horizon Europe-Projektes **ReConnect China** ist das **ZSI** für die Erstellung eines Policy Briefs zum Thema Wissenschaftsdiplomatie zwischen der EU und China verantwortlich. Dabei möchten wir den Schwerpunkt auf **die Forschungssicherheit in der Zusammenarbeit mit China** legen.

Wir befragen hierzu wissenschaftliches Personal an österreichischen Universitäten, das bereits mit chinesischen Partnern kooperiert hat oder das eine solche Kooperation in Zukunft plant.

Die empirischen Ergebnisse aus dieser Umfrage werden mit weiteren Daten und Erkenntnissen aus einer Online-Recherche verbunden und als Policy Brief veröffentlicht.

Umfrage - Details:

Zwischen Mai-Juni 2024, 36 Institutionen kontaktiert, 55 Antworten, davon 24 vollständig, mit Pseudonymisierung

Analysierte Antworten:

Technische Universitäten (13) → TU Wien (8), TU Graz (3), Montan-Universität (2)
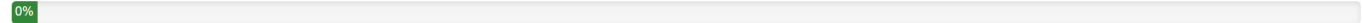
Allgemeine Universitäten (4) → Uni Innsbruck (2), Uni Klagenfurt (1), Uni Linz (1)

Akademie der Wissenschaften (3)

Fach-Hochschulen (3) → FH St. Pölten, MCI, Ferdinand Porsche Fern-FH (jeweils 1)

Verteidigungsministerium (1)

Slide: 15

Bsp. Fragen

- *Wenn Sie bereits eine oder mehrere Kooperationen durchgeführt haben, welches Forschungsthemen haben Sie bearbeitet, wer waren Ihre chinesischen Partner (Institutionen) und wer hat diese Kooperationen gefördert?*

- *Haben Sie momentan Kooperationsanfragen aus China vorliegen oder planen Sie selbst, eine Kooperation mit einem chinesischen Partner zu beginnen?*

- *Bitte beschreiben Sie kurz, zu welchen Themen Anfragen vorliegen (und von welchem chinesischen Partner) oder zu welchen Themen Sie eine Kooperation planen (und mit welchem chinesischen Partner).*

- *Kennen Sie den Begriff „Seven sons of national defence"?*

- *Kennen Sie den Begriff „knowledge security" im Kontext internationaler Forschungskooperationen mit nicht-EU-Ländern?*

- *Denken Sie, dass österreichische und europäische Forscher*innen in Zukunft gar nicht, (viel) weniger, in etwa gleich oder (viel) mehr mit China kooperieren sollten? Bitte führen Sie die Gründe an.*

- *Gibt es Forschungsthemen, bei denen Österreich und die EU unbedingt strategisch mit China zusammenarbeiten sollten, etwa um nicht von technologischen Innovationen oder wissenschaftlichen Durchbrüchen abgehängt zu werden?*

Bsp. Antworten

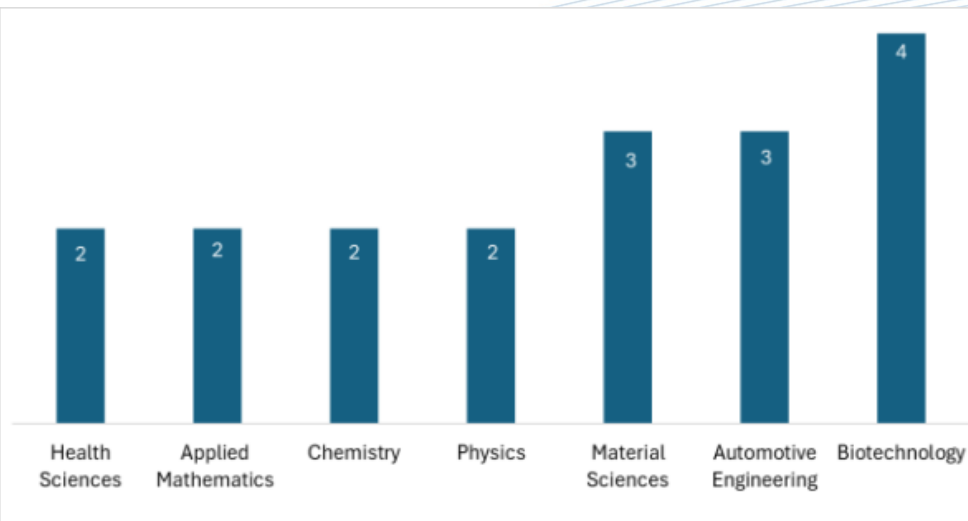**Mehr od. weniger Zusammenarbeit?**

- *Mehr Zusammenarbeit, im Bereich Fahrzeuge ist die Europa mittlerweile in der Technologie weit zurück*

- *Gerne mehr, die studenten sind gut ausgebildet und sehr strebsam und fleissig*

- *Viel weniger, insb im Bereich Halbleiter und Energiematerialien, da wir die Konkurrenzfähigkeit unserer Wirtschaft sicherstellen müssen!*

- *Ich bin für Kooperation mit Augenmaß. Kritische Themen würde ich wenn überhaupt nur mit Partnern durchführen, bei den ein beidseitiger Austausch von Informationen möglich ist.*

- *Wir sollten unsere Kooperation mit chinesischen Partnern ausbauen. Dies ist kann eine wichtige Säule in unserem internationalen wissenschaftlichen Portfolio darstellen.*

Bereiche, wo China strategisch wichtig ist für AT/EU?
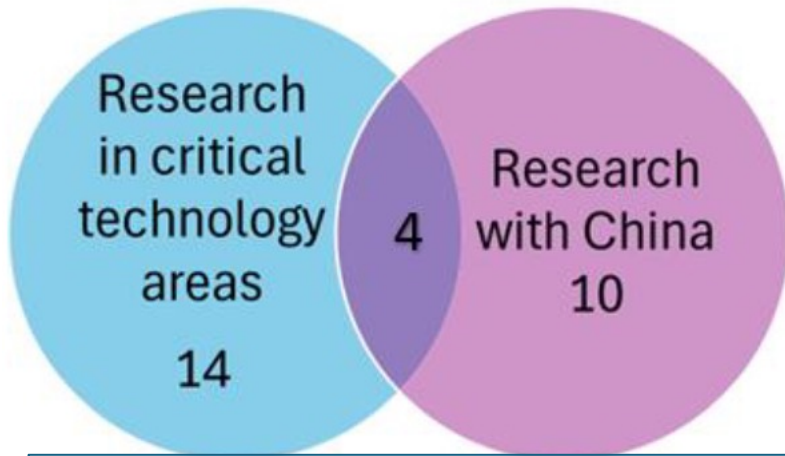
- *Fahrzeugtechnologien*

- *Autonomes Fahren*

- *Carbon capture and storage ist für China zentral und bei uns weit weniger hochrangig gefördert. Hier könnte aus unserer Sicht Interesse an einer Zusammenarbeit bestehen um technologisch bei dieser Tech. nicht abgehängt zu werden.*

- *Die Themen KI-Technologie und Nanotechnologie müssen international untersucht werden, um wettbewerbsfähig zu bleiben.*

- *Für wissenschaftliche Durchbrüche benötigt es keine strategische Zusammenarbeit - diese Formulierung führt in die Irre und zeugt von einem rein utilitaristischen Denken. Wissenschaftliche Zusammenarbeit: ja - ABER: kein strategischen Partnerschaften für technologische Innovation - hier werden nationale Sicherheitsinteressen den monetären Interessen weniger Einzelpersonen im Bereich der globalisierten Wirtschaft geopfert. Das ist naiv bis gefährlich.*

- *Aus dem eigenen Umfeld: im Bereich des Bauwesens ist Europa sehr fortschrittlich, der chinesische Markt und die klimatische Diversität in China bieten hier noch riesiges Potenzial. Gleichsam kann umgekehrt von chinesischer Seite enorm viel gelernt werden im Bereich effizienter und schneller Umsetzung.*

- *In Hinblick auf Forschung zu KI-Architekturen, wie Multiagentensystemen, RAG-Architekturen oder LLMOps allgemein, können bei einer Zusammenarbeit mit China ggw. mehr Vor- als Nachteile gesehen werden, da China hier neben USA die Forschung dominiert.*
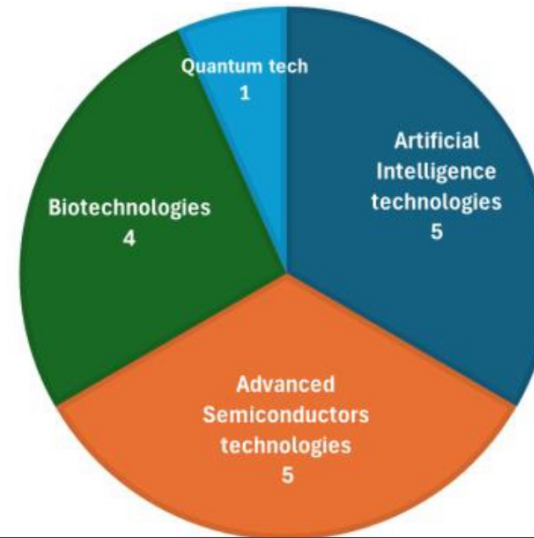
Wollen Sie noch uns noch etwas mitteilen?

- *Von den Chinesen lernen, wie man in ambivalenter Weise kooperiert und dabei Vorteile für sich generiert. Das beginnt bei Sun Zi.*

- Gratulation, dass Sie dieses Thema aufgreifen. Wenn daraus entsprechendes Informationsmaterial / Richtlinien / Anlaufstellen / ... entstehen, ist dies sehr zu begrüßen.

Häufigst genannte Disziplinen der Forscher:innen

Anzahl an Forscher:innen in kritischen Technologien und in Kooperationen mit China

Häufigkeit der genannten 4 kritischen Technologien

Institution	Risk level	Cooperation area	Finished partnership
Hunan University	very high	Material science (Low-emission buildings)	Yes
Tongji University	medium	Autonomous driving	Yes
Shanghai University	medium	Material science (Additive manufacturing of metals)	Yes
CN Academy of Sciences	N/A	Material science	Yes
China Academy of CN Medical Sciences	N/A	Biotechnology	Yes
Shandong University	very high	Biotechnology	No
Sun Yat-Sen University	high	Applied mathematics	No

Partner, Technologien, Risiken

Slide: 18

Five main findings

1. The survey results show that cooperation between Austrian and Chinese researchers **happens in highly-specialised fields**. Some of these were deemed "critical technology areas" by the EC in 2023, such as advanced semiconductors technologies, automated driving and autonomous vehicles, biotechnology or material sciences, while others happen in areas less likely to be used for military purposes (dual-use), such as energy-efficient construction or social sciences and education.

2. Irrespective of their scientific background or engagement level with Chinese partners, **only a minority of the researchers had any ideas about the terms specifically related to research security aspects with China, e.g. 'the seven sons of national defence'.** In addition, based on their own admission, most researchers would **welcome more information about the ongoing R&I policy developments in both Europe and China**, including the presumably relevant joint policy documents, as well as European or Chinese strategies influencing common research trends

3. Austrian researchers already engaged in a formalised research collaboration with Chinese partners were **predominantly satisfied with the contracting procedure**, such as institutional due diligence, and the contractual terms and conditions. They indicated **more problems with practical aspects of the ensuing joint research efforts, e.g., data transparency or mutual benefits**. They also strongly signaled that **they felt insufficiently informed about R&I developments in China** before engaging in collaborative research.

4. The **biggest obstacle to engage** in a joint research effort with Chinese partners perceived by Austrian researchers is **the lack of support in assessing the credibility and security risks associated with potential Chinese institutions**, which might include the conceivable dual-use of common research results.

5. The Austrian researchers are **divided over whether the intensity of research cooperation between Austrian/European and Chinese HEIs or RPOs should be enhanced or decreased in the near future**, and whether there are any strategic areas where Austria/EU and China should definitely carry out joint research activities. Almost as many researchers suggested less cooperation as more, withouth any significant differences by seniority or discipline (critical versus non-critical technology areas).

2025: Was wird (oder sollte) passieren?

Securitisation theory: Critical view
Stage-Gate Processes: From wide open to very close (for projects)
Academia as an institution: Involve all departments concerned

Monitoring and vetting processes
Intelligence gathering & protection cycle, see Brouard, Sprott, 2004

Academia: Continuing pushing the topic to build a first stock of literature which will help to set the scene for future research (important: illuminating the boundaries or overlaps to other fields, e.g. security studies, S&T studies), see Pinna, 2024

Overcome limitation of missing precise definition for „knowledge or research security"

Policy: Implementation of EU Council recommendations in 2025 in a way that ensures accessibility of services and support for all in need; Make proposals and provide ressources

Small yard, high fence? US-model as a blueprint?
Selective decoupling instead of comprehensive disengagement?

Small yard, high fence? US-model as a blueprint?

Economic players: Raise engagement with academia and policy in order to facilitate the process of establishing uniform guidelines where possible and align research security with economic security principles

Funding level: a) Include research security dimensions in all funding schemes' requirements and b) raise volume of funding for research on research security (RoRS), see Dao et al., Responsible Collaboration through appropriate research security, Workshop report, Rice University, 2024

NÄCHSTE PUBLIKATIONEN

- 1-2Q./2025: White Paper on future visions for sustainable collaboration structures with Chinese partners until 2035 – output of the "Awareness, Security and Knowledge in International Collaboration" (ASK) initiative of the Helmholtz German Research Centre for Geosciences Potsdam (GFZ), co-authored by experts from EU, Norway, Switzerland, Canada, USA

- 3.Q/2025: Routledge International handbook of research security (Brendan Walker-Munro, Tommy Shih, Eds): „Research Security with China in Europe: Assessing needs and level of knowledge across researchers in critical technologies and beyond", G. Szüdi, P. Brugner

Ich bedanke mich für Ihre Zeit und Ihr Interesse!