

The Civil Clause: No military research in civilian research institutions

immediate

The Science4Peace Forum

Abstract

The discussion about military research in civilian research institution has gained momentum recently. In Europe, the research center CERN in Geneva has in its constitution written, that " the Organization shall have no concern with work for military requirements", in Germany so-called Civil-Clauses have been issued as a self-declaration and self-commitment of many institutions and universities to work only for civilian and peaceful goals. While there was common agreement on research for peaceful and civil purpose after World War II, recently the discussion of the usefulness of Civil Clauses has been put on the table by the EU commission as well as national governments.

A dangerous development is taking place in science policy. Immediately followed by the invasion of Ukraine, Russian and Belorussian scientists were sanctioned, cooperations were stopped and scientists were excluded from participating in civilian research projects. Attempts to open research institutions, which were in the past a symbol for civilian research, for military purposes, is another step in separating the science communities and creating enemies-images, while giving up the universal feature of science.

Triggered by the announcement of the directorate of DESY to start a discussion whether opening of the research institution for military research in June 2024 and by a white paper of the EU commission from Jan 2024, the Science4Peace Forum started a qualified discussion with a panel discussion in September 2024 on different aspects of Civil Clauses.

In this paper we try to collect arguments for keeping the purely civilian and peaceful focus of public (non-military) research and argue that scientific progress for the benefit of humanity can only be achieved by collective efforts of all countries and nations. A restriction of research to those countries which share the same political values will create only anger, mis-trust and further conflicts, will result in another arms-race and is clearly counterproductive to solving the most important problems humanity is facing now: climate change, poverty and, most of all, the too many wars.

1 Introduction

In January 2024, the EU Commission issued a *White Paper* [1] calling for a special effort to promote research with both civil and military objectives (dual-use research). Similarly, the German Ministry of Education and Research (BMBF) released a *Position Paper* [2] in March 2024 calling for the deepening of cooperation between civilian and military research institutions and for establishing *funding incentives for increased cooperation between civilian and military research*. In its annual report for 2024, the German *Research and Innovation Expert Commission* proposed dissolving the previous separation between civil and military research [3] .

This reorientation is in fundamental contradiction to the spirit of civilian research following the experiences of World War II: the Science Council of Japan vowed in 1950 *to never become engaged in scientific research for war purposes* [4]. At the international research center CERN, where the Higgs Boson was found in 2012, the convention of 1954 [5] demands explicitly that it *shall have no concern with work for military requirements*, and at the Helmholtz Research Center DESY in Germany the guiding principles [6] stipulate that *research pursues goals that are peaceful and serve civil society*. Moreover, many universities and institutions have adopted so-called civil clauses [7] to focus voluntarily their research and teaching to purely civilian and peaceful purposes. With the opening of civilian research to military research, international cooperation is called into question, research funds are withdrawn from civilian research and made available for military research as formulated in a statement [8] of the German University Rectors' Conference (HRK)).

At DESY the directorate has initiated a discussion in June 2024 [9] whether the restriction of research to civilian and peaceful purposes is still adequate, or whether military research should be allowed at the laboratory. This initiative triggered a lot of discussion and protest at DESY, where shortly after this announcement a petition [10] was launched to protest against this move. The topic has also found attention in the national [11] and international press [12].

We are facing significant changes in science policy:

- **Sanctions in Science** Immediately after the start of the invasion of Ukraine, several science institutions in Europe initiated sanctions against Russian and Belorussian scientists. At DESY sanctions [13] imposed include a ban of common scientific publications as well as participation at scientific conferences, where Russian scientists participate under their institutional affiliation. The Science4Peace Forum has collected many arguments against excluding scientists from international cooperations [14]. At CERN, after invasion of Ukraine, collaborations were put on hold. At the end of 2023 the CERN council decided to not to prolong cooperation agreements with Russian and Belorussian institutes after their expiry dates in 2024. The Science4Peace Forum has warned about the long term consequences of such a decision [15]. At least the cooperation of CERN with JINR was not cancelled, and is continuing but still under sanctions and restrictions. These steps marked a clear change in science policy, scientists from certain countries are risking to be excluded from scientific cooperation, a step which did not happen at international organizations like CERN before (only in 1993 Serbia and Montenegro were excluded from CERN based on a decision of the UN security

council [16,17])

- **Role of science in geopolitical strategies** In a report *Security, Resilience and Sustainability* [18] from 2022 the increased role of science in security policy and military research is requested, but with caution ... *if Germany positions itself too assertively [in increased spending for military], its current reputation as a peaceful nation could suffer.* In a report of Leopoldina and DFG from 2024 [19] it is argued, that ... *in doing so, the claim is made that academic research can no longer be carried out solely for its own sake, but also bears responsibility for safeguarding our basic democratic order and other national values.* Further it is argued that ... *as a result, science and innovative power are also increasingly identified in Europe and North America as levers of geopolitical power in order to strengthen resilience and competitiveness in the sense of national security interests.* Even fellowships and student exchange are seen critically ... *young Chinese scientists with a scholarship from the Chinese Scholarship Council (CSC) will no longer be admitted in the future ...* , as written in Ref. [19].
- **Opening civilian research facilities for military research - the civil clause** The discussion about civil clauses and the focus of civilian research institution on purely civilian research has gained momentum recently with a White Paper [1] of the EU commission, where it is argued that resources spend for purely civilian research are missing in funding for military (or dual-use) research. With the further discussion on increased spending for military (at the moment several EU countries increased their spending to 2% of GDP) and the request to increase the spending from 2% to perhaps 3.5 or event 5 %, the resources for pure civilian research will decrease, and institutions maybe forced to look for additional funding, for example by removing civil clauses and opening their research facilities for military dual-use research. While such an attempt might solve the short term funding, it leads dramatic and significant changes in science and research.

In this paper we will discuss these three topics in more detail, with the emphasis that science and especially fundamental science is universal and independent of any political and geo-political strategies. We will emphasize, that sanctions and restrictions in science are counter-productive, and lead only to further separation and confrontation, rather than helping solving international conflict. We argue, that science should play a role in international affairs such that the language of science is used to build bridges and dialogue, instead of banning communication. We also argue that successful science which can serve society and can help solving the most important problems of people must be international, including all countries, as well as that all results must be made available to the public, and by this is required to work only on civilian projects.

2 Sanctions in Science

3 Role of Science in Geopolitics

4 The Civil Clause: history and present

4.1 Some historical remarks on science in Germany

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German scientists had a strong and consequential relationship with militarism in the first half of the twentieth century. During the First World War, most German scientists served as regular soldiers, but a significant minority put their professional expertise to work on early radar systems, aerodynamics for aircraft development, and of course chemical weapons. The overwhelming majority of these scientists supported the German war effort uncritically. Here Albert Einstein was the exception who proved the rule. When Germany was defeated, most scientists, like most Germans, focussed more on the harsh terms of the Treaty of Versailles than what responsibility Germany shared for the war.

When the Nazis came to power in 1933, they began massive investments in rearmament. It is important to note, however, that during this period Hitler publicly insisted that he wanted peace, not war, and the rearmament was only so that Germany could protect itself. When the Second World War began with the invasion of Poland, most scientists, including those opposed to Nazism, were either drafted into the armed forces or found research and development projects that allowed them to serve the war effort as scientists. These projects were similar to those in other countries, like mines, submarines, radar, rockets, aeronautics, and even nuclear weapons. When the war turned against Germany after the defeat at Stalingrad and more and more German men were drafted, scientists came under even more pressure to find positions considered “indispensable for the war effort.” When the war was over, the four victorious powers invited or sometimes kidnapped those German scientists whose research was of military interest. Here the most prominent example was Wernher von Braun and long-range ballistic missiles.

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4.2 The Civil Clause in Japan

4.3 The Civil Clause in Germany

4.4 Civilian and military research in EU

5 Science and Military: National and international Research Institutions

5.1 From Open Science to Military Secrecy: The Risks for DESY

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DESY plays a crucial role in international cooperation. Historically, projects such as the HERA e-p collider benefited from extensive collaboration with numerous European countries, including France and Italy, as well as Russia (initially the USSR), the United States, and Japan. Over the years, DESY scientists have actively participated in major international collaborations at CERN and KEK, engaging with researchers from across the globe. With the commissioning of PETRA III, one of the largest synchrotron light facilities in the world, DESY became a major international hub to study fundamental phenomena in condensed matter, plasmas and molecules, and on the structure and function of complex materials to biomolecules and cells (Photon Science). While DESY is a national laboratory, it is widely recognized as a key international player, regularly reviewed by international committees that consistently encourage collaboration.

Peaceful scientific research conducted by scientists is fundamental to the development of humanity as a whole. Common fundamental goals foster a collaborative environment among researchers from diverse cultural and political backgrounds. The exchange of ideas between different scientific schools is crucial for innovation, promoting both the generation of new concepts and mutual respect for collective achievements. Open scientific hubs such as CERN, KEK, and DESY play an essential role in nurturing these interactions, strengthening the global research community.

International research is also vital for fostering trust among scientists from different nations. Historically, physicists' opinions have played a significant role in shaping governmental perspectives and promoting trust between nations. The end of the Cold War would not have been possible without Soviet leaders trusting that there was no need for ideological conflict with the West and recognizing that both sides shared fundamentally common values. The phone call between M. Gorbachov and A. Sakharov while A. Sakharov was still in exile was one of the main turning points of perestroika. This phone call would not have been possible without the influence of Gorbachov's scientific advisors, who advocated for peaceful cooperation with the West based on Sakharov's concept of convergence.

Fundamental scientific research is inherently dependent on large-scale projects requiring substantial investment. Most cutting-edge facilities built in recent years have relied on contributions from participating nations. A prime example is the European XFEL, operated by DESY, where Russia contributed approximately 27% of the construction costs (up to 300 million euros by 2017 (XFEL)). The war in Ukraine has called into question the inter-

connectedness of financial interests. However, investments in fundamental research have little connection to military activities. The involvement of DESY in military research would jeopardize such investments, making future contributions from international partners highly unlikely. Thus, while short-term financial gains from military research might seem attractive, they could ultimately become a limiting factor for the lab's long-term sustainability and international credibility.

Fundamental physics research, and DESY in particular, have been leading forces in open-access research. Open access is a foundational principle of fundamental science and remains the prevailing model for publicly funded research in Europe. Open-source and open-access frameworks have significant industrial implications, as exemplified by the recent Chinese DeepSeek deep learning model, which could lead to considerable reductions in electricity costs and a smaller environmental footprint. Military research, however, fundamentally contradicts the principles of open access. European science, and DESY in particular, should maintain leadership in open science, serving as a global example of transparency and collaboration.

The introduction of military research into existing civilian-only facilities raises multiple security concerns. Open access to research infrastructure would necessarily be restricted, reducing opportunities for international collaboration. Additionally, laboratories involved in military research become attractive targets for cyber threats from adversarial entities and, in extreme cases, could be considered legitimate military targets during conflicts. The potential for such attacks is particularly alarming given DESY's location in the heart of Hamburg. Any form of military-related targeting of DESY would have catastrophic implications for the city's civilian population. Moreover, DESY employees themselves would face greater security risks. While recent security measures, such as the introduction of two-factor authentication for DESY computing centers, make direct cyber intrusions more difficult, they also increase the likelihood of personal attacks aimed at obtaining authentication devices, placing additional risks on employees. The risks would multiply significantly if military research were introduced.

Furthermore, many physicists have chosen fundamental research precisely because of its strictly non-military nature. These researchers joined civilian institutions like DESY under the assumption that their work would remain uninvolved in military applications. If military research were introduced, they would face an ethical dilemma: continue working in an environment contrary to their beliefs or leave, despite having dedicated much of their careers to their research at DESY.

If military research must be expanded, it should be conducted in dedicated facilities located in less populated areas, designed with comprehensive security measures and clear contractual agreements that align with the nature of military-focused work. This approach would be far more appropriate than compromising the integrity and mission of existing civilian research institutions.

5.2 Research at CERN: “no concern with work for military requirements”

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CERN was founded shortly the end of the Second World War with the explicit intention of bringing together the scientific communities of European countries that had previously been fighting each other, to collaborate, in the words of its Convention, on “research of a pure scientific and fundamental character, and in research essentially related thereto”. It is widely known that the CERN Convention goes on to state that the Organization “shall have no concern with work for military requirements”. The French version of the CERN Convention states that the Organization “s’abstient de toute activité à fins militaires”, which corresponds more clearly, perhaps, to “refrains from any activity for military purposes”. To my knowledge, this rule has always been strictly applied, to the extent that CERN has refused to collaborate with institutions that are involved in military research. “Science for Peace” is in CERN’s genes.

I once accompanied a CERN Director-General who shall remain nameless to on a visit to a research group that shall remain nameless in a country that shall also remain nameless, with the aim of expanding scientific collaboration. The discussion started swimmingly. Unfortunately, I had to rush out for a moment to attend to an urgent call of Nature. When I returned a few minutes later, the atmosphere had turned distinctly chilly, and the meeting broke up prematurely. I discovered later that our prospective partners had revealed they worked on military laser systems, and that put a stop to any discussion of collaboration.

On another occasion, another nameless institute in a different nameless country approached CERN about collaboration. However, due diligence revealed that the institute worked on ballistic missiles, so that was the end of that discussion.

In some cases, however, CERN does collaborate with research establishments that do some military research. However, these are institutes - both in CERN Member States and elsewhere - that have fences across their campuses separating groups working on military research from their civilian colleagues. Only the latter may collaborate with CERN.

DESY is one of CERN’s most valued research partners, and it is reasonable to ask what would happen to this partnership if DESY were to accommodate dual-use research. If the research with military applications were separated from the civilian researchers by a fence, the collaboration could perhaps continue unimpeded. But does DESY really want its campus to be divided by a fence? I fear that the character of the institute would change irreversibly for the worse.

After the statement against military research, the CERN Convention goes on to state that “the results of its experimental and theoretical work shall be published or otherwise made generally available.” CERN takes this provision very seriously, insisting (like many funding agencies) that all its research be published under “Open Access” rules. To my mind, this provision places another significant obstacle in the way of collaboration with institutes that perform dual-use or military research. CERN has recently extended the principle of openness to include Open Infrastructure, Open Source Software and Open Hardware.

The insistence on avoiding any association with military research has played a key role

in enabling CERN to become a global research centre. As such, it has hosted research teams from many countries that are political or military adversaries, such as India and Pakistan, Israel and Palestine, Iran and the US, even until recently Russia and Ukraine. As the founders of CERN recognised, research into the fundamental laws of physics is a topic of universal interest and value, that advances best if it is open to all scientists whatever their origin and its results are published in the open scientific literature. Until now, DESY has adopted a similar policy of openness, and has also developed into a global research centre. It is to be hoped that DESY will be able to resist any political pressures to change this policy, and avoid harming its enviable reputation.

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