

National Discourses on Ethics in Research in Germany

1. Science – Roots and Ambitions
2. Science and Ethics in Germany: DFG/Leopoldina
3. Ethics Commissions: Practice and Recommendations

Götz Neuneck, www.ifsh.de

Hamburg, IFSH

1. Science: Its Roots and Ambitions

„The purpose of science advancement is to carry the torch of humanity, to inspire wisdom and to lay the foundations for innovation“ Beijing Declaration by CAS and Leopoldina, 2019

- **Science:** New Understanding of the human existence and authority: „Further Development of Reasoning to understand the world“
- **Main principles:** Neutrality, Objectivity, Progress, Openness etc
- **Methods:** Experiments, Empirical Testing, open exchange: *Sharing of data, techniques through publications and collaborations is the basis of scientific work*
- **Era of Enlightenment:** Based on humanism and the idea of progress, but knowledge and capacities can be „misused or used“ for death and destruction (Dual-Use Character)
- Dependence on **financial support** for modern science mandatory
 - **Science needs Freedom, Freedom entails Responsibility, Responsibility includes ethical considerations**

International Declarations: UN/UNESCO

“UNESCO seeks the scientific relations of the peoples of the world – to advance the **objectives of international peace and of the common welfare of humankind** for which the UN Organization was established.”

“Scientific discoveries and related technological developments and applications open vast prospects for progress (...) but may be, at the same time, entail **certain dangers** which constitute a threat, esp. in cases where the results of scientific research are used against humankind’s vital interests in order to prepare wars involving *destruction of a massive scale or for purposes of the exploitation of one nation by another, or to the detriment of human rights or fundamental freedoms or the dignity of a human person*, and in any event give rise to complex and legal problems.”

Preamble - Recommendation on Science and Scientific Researchers,
UNESCO General Conference 2017, ANNEX II

Social Responsibility of Scientists

„Scientists will understand the technical problems better than the average politician or citizen, and knowledge brings responsibility“

„Remember this, that you have knowledge and you are responsible for how this knowledge is properly used. Scientists can provide **technical advice and assistance** for solving the incidental problems that may emerge“

„Scientists can warn of further dangers that may raise from current discoveries. Scientists can form an international fraternity that transcends beyond natural boundaries, so that they are well placed to take a global view in the interest of mankind“

Sir Joseph Rotblat and Sir Michael Atiyah , 2003

Some Functions emanating from these experiences.....

- Impartial, objective and authoritative reporting **to raise awareness** about the use of WMD under any circumstances and advise governments and state parties to invest in appropriate **efforts for arms control and non-proliferation** (Preventive Function)
- Ongoing **public debates** about the „Social Responsibility of scientists“ in open research institutions and universities (Public Function)
- **Open science** at universities: civilian clauses: open and transparent work only for peaceful purposes. (Educational Function)
- Science Diplomacy and International Cooperation (International Function)
- Studies on the prevention of a destabilizing use of modern technology

Dual-Use Potential of Scientific Research

„Dual-Use is a term that is applied to the tangible and intangible features of a technology that enable it to be applied to both hostile and peaceful ends with no, or minor, modifications.“

[McLeish and Nightingale 2005]

Free Basic Research:

- essential for scientific progress
- Needs exchange of results, publications
- Supported for industrial, societal applications



Research Risks:

- Unintended, harmful consequences
- Misuse of research results by third parties

**What are the frontiers of science?
Who determines these borders?
Who changes or enforces these borders?**

T. Lengauer, MPI for Informatics; JC Leopoldina, 29/4/2022

Recent Cases of Dual-Use Research of Concern

- **Herfst, S., et al.** (2012). Airborne Transmission of Influenza A/H5N1 Virus Between Ferrets. *Science* 336(6088): 1534-1541.
- **Imai, M., T. et al.** (2012). Experimental adaptation of an influenza H5 HA confers respiratory droplet transmission to a reassortant H5 HA/H1N1 virus in ferrets. *Nature* 486(7403):420-428.
- **Nuclear research:** Weapons of mass destruction?
- **Pathogen research:** Bioweapons for terrorist attacks?
- **Artificial intelligence & machine learning:** tools for criminal hackers and mass surveillance or Autonomous Weapon Systems?
- **Materials research** and nanotechnology: weapons of attack?
- **High Power Lasers** as Anti-Satellite Weapons?
- Research on **industrial robots:** Building drones?
- **Quantum sensors:** Anti-Submarines warfare?
- **The Dual-Use problem applies to all scientific fields !**

2. Science and Ethics in Germany

- Research freedom is protected by **constitutional law** (§5)
- This is a **cornerstone** for the progress and prosperity of the society
- **Research freedom** induces a significant burden of responsibility as important and useful research findings can be misused for harmful purposes
- The Leopoldina (fd. 1652) and DFG (German Research Foundation) is based on **self-government and self-organisation** of science and research
- These organizations, universities and institutions work continuously **to ensure compliance with ethical principles** safeguarding a responsible handling of research freedom and research risks
- Leopoldina Guidelines (2014) and Joint Committee **working**
- German research institutions have set up **commissions for ethics** (KEFs) in security-relevant research in line with the 2014 guidelines

Leopoldina, Progress Report Joint Committee of DFG and Leopoldina on the Handling of Security-Relevant Research, November 2020

Leopoldina/DFG „Scientific Freedom and Scientific Responsibility“ 2014

Weighing the risk of potential misuse of research findings versus their benefits presents **special challenges** for the responsibility and self-control of researchers (p.6).

Legal regulations can only cover these risk to a limited extent. (...)

After all, researchers' knowledge, experience and freedom give them a **special ethical responsibility** that goes **beyond legal obligations**. In addition, research institutions should **create framework conditions for ethically responsible research**.

In critical cases (of the danger of misused research), these individuals must draw on their knowledge and experience **to make a personal decision** about what is responsible in research. The primary goal in all of this is to carry out and communicate research in a responsible way.

Tools are **a risk analysis**, measures for reducing risk, evaluating the publication of research results, and abstaining from research as a last resort.

Research institutions **need to develop ethic rules for handling security-relevant research** that go beyond compliance with legal regulations.

Each institution should set up a special committee on research ethics to implement these rules and advise scientists.

Definition - Security-related research of concern

"**Security-related research of concern** includes scientific work which has the potential to generate *knowledge, products or technologies* that could **be directly misused by third parties** to cause **significant harm to human dignity, life, health, freedom, property, the environment or to significantly harm peaceful coexistence.**"

[Joint Committee on Dealing with Security-Related Research, Sept. 3, 2019]

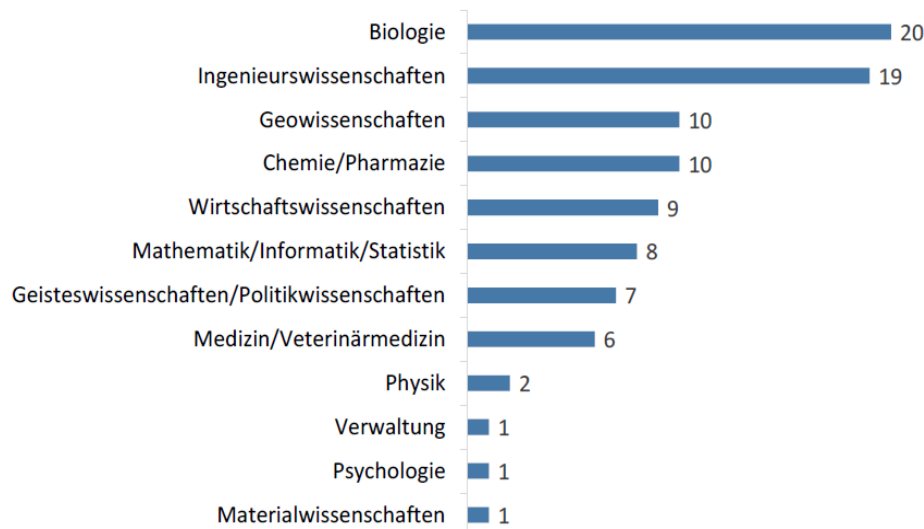
Joint Committee of DFG and Leopoldina

- Push and monitor **implementation** of the recommendations at the level of research institutions
- Supports implementation, especially in **establishing** “Kommissionen für die Ethik sicherheitsrelevanter Forschung” (**KEFs**) at institutions
- **Contact person** of the KEFs and platform for the bundled exchange of experience
- **Responsibility for individual discussion cases should generally lie with the respective research institutions.**
- In special cases: **Ad hoc working group** of the Leopoldina for risk-benefit assessment and recommendations

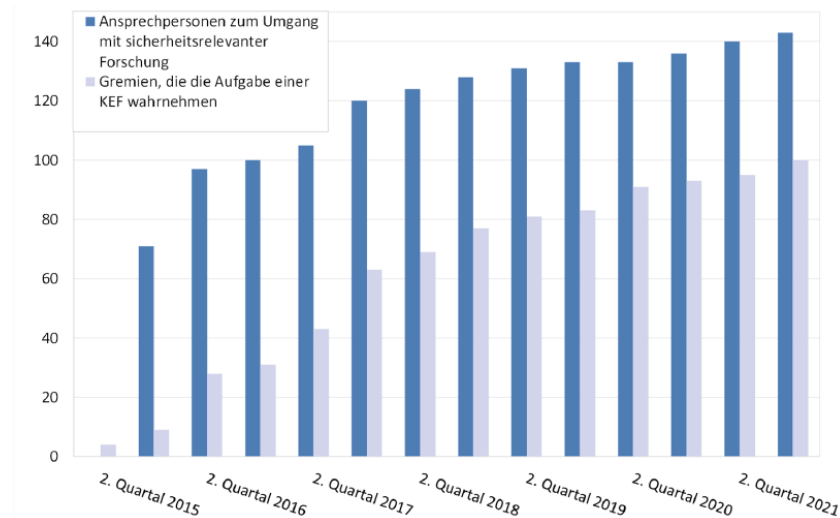
Some Statistics of Cases and Committees (2016-2021)

- The sciences and humanities should themselves develop ethical principles and mechanisms for the responsible handling of freedom of research and research risks
- This process needs flexible and relevant self-regulation
- Additional legal regulations can only cover the risks of free research to a limited extent

94 **cases** between 2016-2021
(Approved: 66, Approved with conditions 21, Negative 7)



Numbers of **contact persons** and **commissions** are increasing



DESY Commission for Ethics in Research

- German research institutions and its researchers should draw up **ethical rules for dealing with security-relevant research** which go beyond legal requirements.
- Based on **Statutes and Rules of Procedure** (See 2014 Guideline of Leopoldina and DFG)
- Commission **advises scientists** on research projects with ethical risks and can make recommendations to the Directorate on ethical aspects of research projects.
- DESY scientists, Directorate, Foundation Council and Scientific Council are entitled **to submit requests**.
- **Separation** from questions of good scientific practice, but if relevant, cooperation with ombudspersons
- **Networking:** U Hamburg, Zeuthen, Pools of Experts, Exchange with Helmholtz

Website: https://ethik.desy.de/index_eng.html

Promotion of Security-related Research in EU

In the **EU Framework Program for Research and Innovation**:

- *Ethical self-evaluation* with regard to risks of misuse mandatory when submitting applications
- *Establishment of advisory bodies* for relevant ethical issues recommended

DFG asks applicants:

- to review their project with regard to safety-relevant risks and, if necessary, to *include a KEF statement* on the risk-benefit ratio and risk minimization measures with the DFG funding proposal.
- The need for *responsible, regulated handling of safety-relevant risks* is firmly anchored in the DFG guidelines for safeguarding good scientific practice.

Recommendations for the Handling of Security-relevant Research of Concern

- *Awareness of ethic principles by researchers beyond legal regulations*
- *Risk analyses by experts*
- *Risk Minimization*
- *Documentation and exchange of risks*
- *Risk of publication?*

Researchers

- *Education and awareness training*
- *Availability of compliance bodies*
- *Definition of ethic rules by research institutions*
- *Establishment of advisory committees for ethics in security-relevant research (KEF)*

Research Institutions

T. Lengauer, MPI for Informatics; GA Leopoldina, 29/4/2022

Some Literature

- Consolidated report on the implementation by Member States of the 1974 Recommendation on the Status of Scientific Researchers
<https://unesdoc.unesco.org/ark:/48223/pf0000259256>
- Neuneck, G. (2020). Balancing open-science collaboration and national security: Lessons Learned from history and current challenges. See in the following:
- Summary Report - International FEL Expert Meeting: “Use of free-electron lasers and beyond: Scientific, technological, and legal aspects of dual use in international scientific cooperation”. F. L. W. Kircheisen, F. Le Pimpec, G. Neuneck. Hamburg, Deutschen Elektronen Synchrotron (DESY): 11-15.
- “Military Work threatens Science”, Nature 556, 273 (2018) doi:10.1038/d41586-018-04588-1
- Leopoldina, Progress Report JC of DFG and Leopoldina on the Handling of Security-Relevant Research, November 2020.
- Current Developments in Science and Technology and their Potential Impact on International Security and Disarmament Efforts. Report of the Secretary-General Report of the UN Secretary-General, General Assembly A/73/177, 17. July 2018, <https://undocs.org/a/73/177>
- Leopoldina/Deutsche Forschungsgemeinschaft: “Scientific Freedom and Scientific Responsibility: Recommendations for Handling Security-Relevant Research on the Individual and Institutional Level” (2014).