ARTICLES

Germany: Disarmament Research in Physics

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To some extent motivated by the US role model, in the last two decades new research groups for disarmament and international security have been started in science in Germany. This article is to provide a short overview of their history, status, and outlook.

It all started when in 1984 a fellowship program of the Volkswagen Foundation met a few physicists who had been active in the scientists' peace movement and had cared about their science's connections to war and peace. After a few years of fellowships and one-person projects, the Volkswagen Foundation supported, from 1988 on, the foundation of three groups:

(1) IANUS (Interdisciplinary Research Group in Science, Technology, and Security) at Darmstadt University of Technology. Among its members were/are physicists, mathematicians, biologists, economists, ethicists. They do studies on nuclear-material verification and disposal, models of strategic stability, detection of bio-warfare agents, etc.[1]

(2) BVP (Bochum Verification Project) at Ruhr-Universität Bochum, later also Dortmund University, comprised mainly of physicists. Their focus is on the potential of acoustic, seismic, and magnetic sensors for the cooperative verification of limits on military land and air vehicles. Another strand deals with military technology assessment.[2]

(3) CENSIS (Center for Science and International Security) at Hamburg University. Here, physicists, computer scientists, and mathematicians work on automatic processing of overhead images, stability models, and military-technology assessment.[3]

In addition, a few individual scientists are at work at research institutes.

Whereas this work is recognized by the respective department and university, only IANUS has been successful in getting continuous - though limited - university/state funding. Also here, there is a high dependency on external projects funds. Due to the underdeveloped field, these flow fairly irregularly. Nevertheless, at all institutions an impressive number of projects has been funded and carried out.

Informal cooperation between the three groups grew into FONAS (Research Association Science, Disarmament, and International Security), founded 1996 at Bad Honnef near Bonn, in the Physics Center of the German Physical Society DPG.[4] The DPG has some tradition concerning disarmament - in 1957 eighteen leading German nuclear physicists signed a letter opposing a nuclear-armed Federal Republic of Germany. Much later, the DPG spoke out in favor of the comprehensive nuclear test ban and founded a corresponding commission. From 1995 on, physicists from the FONAS community organized topical sessions on Disarmament and Verification at the annual DPG Spring Meetings. In 1998, DPG founded its Committee Physics and Disarmament (AKA, Arbeitskreis Physik und Abrüstung) that from then on co-organized the sessions together with FONAS.[5] Among the main topics are: test ban, verification technology, nuclear disarmament, missile defense, mine detection, military-technology assessment. The goals

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1 http://www.ianus.tu-darmstadt.de

2 http://www.ep3.ruhr-uni-bochum.de/bvp

3 http://www.kogs.informatik.uni-hamburg.de/censis

4 http://www.fonas.org

5 http://www.dpg-fachgremien.de/aka/index_e.html. The AKA speaker is Jürgen Altmann, deputy speakers are Götz Neuneck and Christoph Pistner. Note that AKA is solely for disarmament. There is a separate Committee on Energy, AKE.

are to provide information on actual problems of physics and disarmament, to present the results of recent research, and to provide a forum for the presentation of industry/government work that is normally not published. Often, main lectures are given by invited speakers from the USA.[6, 7] Our audience varies between 20 and 200 physicists, i.e., we reach 5 to 10 % of the attendees at the Spring Meetings.

After the elections of 1998 the new Federal Minister of Education and Research wanted to resume Federal funding for peace and conflict research (which had been reduced to zero by the former government). Projects involving the natural sciences were among the first to be funded. Five of these formed joint projects on preventive arms control, three dealt with verification technologies, and one with mathematical modeling.[8] These projects lasted only little more than a year. From 2002 on, funding takes place via the new German Foundation Peace Research (DSF), which unfortunately, due to its limited capital, has a lower budget for projects. Still, natural-science groups have successfully applied for funds and will be able to continue significant work.

There is now a small community in Germany of professionals doing research of disarmament and international security using methods from the natural sciences. More than a dozen doctoral dissertations and diploma theses have been written.[9] Colleagues take part in the Pugwash Conferences on Science and International Affairs and the Summer Symposia on Science and Global Affairs.[10] Repeatedly, we have been called upon to do studies for the German Federal Parliament (the Bundestag has an Office of Technology Assessment TAB that - different from its U.S. precedent - still is alive and well). Twice per year, FONAS is organizing a briefing in the German capital (first Bonn, now Berlin), attended by politicians and staff from Parliament and Ministries, as well as journalists. Within DPG, the Committee Physics and Disarmament is respected. Important discussions have been initiated, e.g., about the use of highly enriched uranium in the new German research reactor FRM II.[11]

The central institutional task for the next few years is to provide more continuity - in personnel and funding. Most important would be a few professorships for this area of research and teaching. This could be done if physics departments decide to open up a job description for a new professor to include problems of disarmament and international security.

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6 U.S. invitees 2000-2002 were: Richard Garwin, Ted Postol, Allison MacFarlane, George Lewis, David Mosher, and Geoffrey Forden. Abstracts of all talks at the AKA sessions are accessible via http://www.dpg-tagungen.de/archive, year, Physikertagung, Arbeitskreis Physik und Abrüstung.

7 With U.S. speakers present in Germany, we often ask them to speak at AKA/FONAS briefings in the capital, see below.

8 Preventive arms control: http://www.fonas.org/prk

9 Some exemplary topics: stability models with missile defense, tritium controls, magnetic vehicle detection, change detection in multispectral overhead images.

10 http://www.summersymposium.org

11 Phys. Blätter 55 (1999) 16 ff.