

## AGA 8: Nuclear Weapons

Time: Friday 9:30–11:30

Location: PTB HS HvHB

**Invited Talk** AGA 8.1 Fri 9:30 PTB HS HvHB  
**Irreversible Elimination of Large Strategic Nuclear Weapons**  
 — ●ROBERT KELLEY — Distinguished Associate Fellow, SIPRI

Very large strategic nuclear weapons that threaten mankind depend on tritium boosting of their fission stages to produce the higher yield. If tritium is denied, the weapons will cease to work because natural radioactive tritium decay occurs. If no new production of civil tritium is allowed under a tritium production halt treaty, stockpiles will quickly begin to cease to function. About half of large weapons will be rendered useless every 12 years while tritium must be redistributed to the remaining devices. This reduces numbers of weapons, but it also makes existing nuclear war planning obsolete. Note that Ukraine gave up old Soviet weapons due to lack of tritium. Weapons without tritium are irreversibly deleted from the inventory if there is no new tritium. New weapons without tritium can be designed, of course, but the status quo will be destroyed until then.

AGA 8.2 Fri 10:30 PTB HS HvHB  
**Back to the Origins: Who knows what in the Manhattan project and the Uranium Club?** — ●GÖTZ NEUNECK — IFSH, U Hamburg

The development of building the first atomic bomb during WWII was a race of scientists in allied states and Nazi-Germany based on fundamental discoveries, theoretical considerations and experiments in the new field of nuclear physics. Although it is very clear that the German Uranium Project did not construct a nuclear bomb, until today there are ongoing controversies about the motivations, resources and knowledge of the key scientists on both sides. It is important to understand the chronology of events and achievements in both projects. The Manhattan Engineering District Project achieved the goal and three nuclear devices exploded in New Mexico, Hiroshima and Nagasaki. Beyond the technical skills the question is what did the scientists know

about the purpose of the nuclear gadgets they created. 85 years after the events a lot of documents, analysis and comments are available to assess the development of the programmes and to answer the three questions: 1. What did the main actors know how to build a bomb? 2. What was there motivation and justification? 3. When did they realize the implication of their work and how did they react? Until today this story of great and dedicated science and politics, moral, conspiracy and secrecy is an important lesson about the ambivalence of science and the responsibility how to handle the nuclear threat.

AGA 8.3 Fri 11:00 PTB HS HvHB  
**What you never wanted to know about the atomic bomb** — ●OLAF SCHUMANN — Fraunhofer INT, Euskirchen

Unfortunately, nuclear weapons still play a great role in our time: Russian officials openly discuss their use in the Ukrainian war, the Joint Comprehensive Plan of Action (JCPOA), that was to prevent an Iranian bomb, has basically failed, Russia has withdrawn from the Comprehensive Nuclear-Test-Ban Treaty (CTBT) and in the war between Israel and the Hamas a large-scale escalation with Israel's neighbors might force Israel to use its nuclear weapons as a matter of last resort, just to name some recent examples.

Research on this subject has many facets, like nuclear disarmament, mitigation of nuclear weapons effects, studies on strategic deterrence, prevention of nuclear proliferation, detection of special nuclear material, or the ban of fissile material or complete weapons. In all these areas, varying knowledge about design and functioning of a nuclear weapon itself is needed. This talk will give several examples of open sources, where such information can be found and that may be valuable for other researchers. It will discuss some aspects of nuclear weapons that everybody in the field should be aware of, and it will present some more obscure findings that show how much is known about (mostly US) weapons.