



PHYSIKALISCHES KOLLOQUIUM

des Fachbereichs Physik
der Johann Wolfgang Goethe-Universität Frankfurt

Mittwoch, den 10.05.2023, 16 Uhr c.t.
Großer Hörsaal, Raum _0.111,
Max-von-Laue-Str. 1



Prof. Dr. Malte Götsche
III. Physikalisches Institut B.
RWTH Aachen

Physics and Nuclear Disarmament

With the Ukraine War, the threat of nuclear weapons use has re-emerged in the public debate. Today, there exist over 12,000 nuclear weapons globally, and large fissile material stocks allowing the production of many more. While the war and the political climate will not allow disarmament initiatives in the foreseeable future, the public debate has triggered a new sense of urgency. Physicists have an important role: To enable international agreements on warhead and fissile material reductions, strong verification protocols are essential to monitor compliance. New concepts and techniques will be required and must be available should a political window of opportunity open in the longer term. As they can take many years to develop, continuing this work remains crucial today. In this presentation, three elements of a possible verification toolbox will be presented. First, radiation detection techniques suited to establish the authenticity of nuclear warheads to be dismantled must be developed. Second, new concepts are required to estimate the amount of produced weapons-usable fissile materials. This is the purpose of nuclear archaeology, which attempts to reconstruct the past fissile material production using forensic measurements in shut-down nuclear facilities and extensive simulations. Third, we discuss the detection of antineutrinos from nuclear waste as part of nuclear archaeology.

Die Dozentinnen und Dozenten der Physik