Geopolitics of Radiation Protection

The Chair of Science Technology and Gender Studies (STGS) at **Friedrich-Alexander Universität Erlangen-Nürnberg**, Germany, in collaboration with the Department of International Relations and Governance Studies at **Shiv Nadar University**, India, organizes a workshop to be held June 13-14, 2025, in Erlangen, Germany. The workshop is part of the "Living with Radiation: The Role of the International Atomic Energy Agency in the History of Radiation Protection" (HRP-IAEA) project that has received funding from the **European Research Council** (ERC) under the European Union's Horizon 2020 research and innovation programme (Grant agreement No770548)

The workshop will be held at the Kultursaal, Stadt Erlangen, Luitpoldstrasse 45, next to the Siemens MedMuseum. It follows the opening of the *Living with Radiation* exhibition the day before, at the museum. https://livingwithradiation.eu

DAY 1: June 13, 2025

Welcoming: 9.00 AM

- **Maria Rentetzi,** Friedrich-Alexander-Universität Erlangen-Nürnberg & **Kapil Patil,** Shiv Nadar University.

Session I: 9.15 AM – 10.45 AM

- **Surveying Strontium-90: The Political, Ethical, and Religious Dimensions of Mapping Global Radioactive Fallout**
  Ronald E. Doel, Smithsonian Institution | Florida State University.

- **Afro-Asianism, Peaceful Atom, and Moral Outrage against Radioactive Fallout**
  Kapil Patil, Shiv Nadar University.

- **Scientists against Nuclear Power: Building a Transnational Community of Counter-Experts in the Field of Radiation Protection during the 1980s**
  Elisabetta Bini, University of Naples Federico II.

Coffee Break

Session II: 11.00 AM – 12.00 PM

- **Cleaning up Nuclear Residues: The Company Nucleco in the Context of Italy's Radioactive Waste Management**
  Mauro Elli, University of Milan "La Statale".

- **Between Allies and Adversaries: Greece on the IAEA's Cold War Battlefield (1957-1961)**
  Loukas Freris, Friedrich-Alexander-Universität Erlangen-Nürnberg.

Coffee Break

Session III: 12.15 PM– 1.15 PM

- **Radiation Stories: Living with the History of Atomic Testing in the US Midwest**
  Emily Yates-Doerr, Oregon State University.
- **Between Detonations and Everyday Life: An Ethnographic Study of India's Nuclear Testing Site**
  Abhishek Saxena, Shiv Nadar University.

Lunch Break:

Roundtable: 5.00 PM – 7.00 PM

Kultursaal, Stadt Erlangen, Luitpoldstrasse 45

Science on Display: Three Dialogues

Moderators:
Maria Rentetzi, Friedrich-Alexander Universität Erlangen-Nürnberg &
Kapil Patil, Shiv Nadar University.

Angela Liberatore, European Research Council, Head of the Scientific Department.
Aristides Baltas, Professor Emeritus, National Technical University of Athens, Ex-Minister of Minister of Culture and Sports and Ex-Minister of Culture, Education and Religious Affairs of Greece.

Theresa Deichert, Assistant Curator, Kunsthalle Giessen.
Natalie Baudy, Dramaturg, Schauspiel Erlangen.

Gabriella Ivacs, International Atomic Energy Agency, Head of Archives and Records.
Meghan Beaudet, National Museum of Nuclear Science, United States.
Kristina Ford, Friedrich-Alexander Universität Erlangen-Nürnberg.

DAY 2: June 14, 2025

Session I: 9.30 AM – 10.30 AM

- **Performative Demonstrations of Safety in the Face of Fear: From Fukushima to Phosphogypsum-Base Roads,**
  Péter Marton, Institute of Global Studies, Corvinus University of Budapest.

- **Harmful Memories of Lugol's Solution**
  Daniel Kikola, Warsaw University of Technology.

Coffee Break

Session II: 10:45 AM – 11:15 PM

- **Radiobiology In-Between: The 1957 International Exhibition and Nuclear Congress in Rome**
  Donatella Germanese, Max Planck Institute for the History of Science.

Closing remarks: 11.15 PM-12.30 PM

List of Abstracts (as they appear in the program)

Surveying Strontium-90: The Political, Ethical, and Religious Dimensions of Mapping Global Radioactive Fallout

Ronald E. Doel, Smithsonian Institution | Florida State University, US.

Abstract: How could U.S. government agencies learn how far fallout from American nuclear tests had spread across the United States–and around the world? By the early 1950s officials at the White House and the Atomic Energy Commission (AEC) fretted about uncertainties: how much bomb-produced radiation had spread across the U.S. mainland into Europe, South America, Africa, the Soviet Union, China, Indonesia? Fallout mattered simultaneously for assessing human health risks, managing Cold War international diplomacy, and countering arguments from geneticists and ecologists that nuclear technologies posed unacceptable risks. To create a detailed map of global bomb-generated fallout, the AEC sponsored an initially secret undertaking, Project Sunshine, led by geochemist J. Laurence Kulp at Columbia University. By 1957 Sunshine researchers produced declassified assessments of where Strontium 90 had traveled around the globe, utilizing new sampling techniques Kulp helped pioneer. It was, Kulp later declared, "the first great environmental study... directed at a purely humanitarian objective," inspiring subsequent nuclear test bans. The reality was more complicated. Columbia colleagues perceived ethical conflicts: Kulp clandestinely secured human body parts for precise sampling from compliant overseas physicians. And: might religious fervor undermine scientific objectivity? Kulp (and many fellow geochemists he recruited) were evangelical Christians actively debating Biblical theology– "theochemists," their secular colleagues termed them. We fortunately have studies examining how Barry Commoner, Linus Pauling, and other U.S. scientist-activists opposed nuclear weapons testing. Exploring Kulp's distinct understanding of scientific, political, and cultural risks provides important insights into Cold War divides between physical and biological environmental scientists.

Afro-Asianism, Peaceful Atom, and Moral Outrage against Radioactive Fallout

Kapil Patil, Shiv Nadar University, India.

Abstract: The Bandung Conference was the first high-profile formal conference of newly independent (post-colonial) states held at a momentous juncture in the Cold War. The conference's final Communiqué expressed strong sentiments against colonialism, racial inequality, and the pathway to a new international economic order. In seeking to be part of the "next industrial revolution" engendered by nuclear science and technology, the conference outlined a Global South collective on disarmament and peaceful atomic energy cooperation. Expressing its profound moral outrage on radioactive fallout from atmospheric nuclear explosions, the Conference appealed to developed nations to end nuclear test explosions and expedite the sharing of the peaceful benefits of atomic energy. The moral upsurge against radioactive fallout saw Afro-Asians, including India and Ghana, voicing concerns about the perceived Western epistemic "hegemony" in producing objective scientific knowledge on radioactive fallout and exposure. As the seminal scientific studies made by the U.S. National Academy of Sciences (NAS) and British Medical Council (MRC) on radiation effects came to be questioned for their perceived non-objectivity, Indian scientists produced a first-of-its-kind study on radiation effects from the developing world correcting the epistemic imbalance. The Global South's moral upsurge against fallout nonetheless turned into a radiation protection pragmatism with the gradual embrace of peaceful atomic energy applications and concurrent international radiation protection standards.

Scientists against Nuclear Power: Building a Transnational Community of Counter-Experts in the Field of Radiation Protection during the 1980s

Elisabetta Bini, University of Naples Federico II, Italy.

Abstract: This paper analyses the forms of scientific counter-expertise that developed in the field of radiation protection during the 1980s. Based on a variety of different sources – such as the papers and reports published by the main institutions in charge of regulating radiation protection (the ICRP, the IAEA and the UNSCEAR), the private papers and publications of scientists, groups and social movements involved in producing forms of scientific counter-expertise, and the journals of the main scientific associations on radiation protection – it examines the ways in which scientists as counter-experts influenced public and political debates about the consequences nuclear installations might have on people's health. This paper argues that in the first half of the 1980s scientists increasingly defined themselves as counter-experts and questioned the forms of regulation that were implemented nationally by ministries and health institutes and internationally by institutions such as the ICRP, the IAEA and the UNSCEAR. By participating in professional associations such as IRPA, and through their activism in international antinuclear and environmental groups and movements, they were able to build a transnational community of counter-experts and influence the public and political debate about nuclear safety. This was particularly clear in the aftermath of the Chernobyl disaster, when scientists mobilized their knowledge, expertise and networks to challenge the policies carried out by the IAEA and the WHO. They organized counter conferences across Western Europe, highlighting the health risks of the radioactive fallout, and pressured the European Parliament and national governments to improve their legislation on radiation protection and nuclear safety.

Cleaning up Nuclear Residues: The Company Nucleco in the Context of Italy's Radioactive Waste Management

Mauro Elli, University of Milan "La Statale," Italy.

Abstract: Historically, Italy has faced persistent challenges in the management of low- and intermediate-level radioactive waste. This issue stemmed from deficiencies in the initial regulatory framework in the early 1960s. These regulations required nuclear plant operators to provide only a preliminary indication of methods for waste disposal, without imposing specific constraints. Furthermore, the disposal of radioactive materials from agricultural, industrial, medical, and scientific applications remained unregulated. The legal framework remained unchanged until 1995, leading to a significant delay in the transposition of European regulations and a disorderly approach to waste management and the connected radiological risk mitigation. This study explores how, in the absence of legislative initiatives and amid two decades of governmental inertia, Italy's technical-administrative apparatus assumed responsibility for addressing low- and intermediate-level waste disposal, thus enhancing radiation protect. Actively engaged in key positions within institutions such as the ICPR and the OECD Nuclear Energy Agency, these experts were acutely aware of Italy's misalignment with international best practices. Utilizing previously unpublished and unindexed records from the former national nuclear agency, ENEA, this research analyzes Nucleco's activities from its founding to 1994 through a business history perspective. Beginning with hospital radium needles dating back to the 1930s, the firm Nucleco developed significant internal expertise in the 1980s. Under the leadership of Silvio Cao, a key figure in Italy's nuclear fuel sector, the company established an "integrated service" for the collection, treatment, and temporary storage of radioactive waste. In Cao's strategic vision, Nucleco was expected to expand its activities to cover the entire back end of the nuclear fuel. In this way, Nucleco's trajectory became intertwined with Italy's failure to establish a national repository for low- and intermediate-level radioactive waste. At the same time, Cao maintained direct contacts with the Soviet Union, aiming to develop technical cooperation that would facilitate the transfer of a portion of Italy's

radioactive waste abroad. These ambitions were significantly curtailed after 1989, particularly following Cao's removal and the country's broader financial crisis in 1993. However, the "integrated service" remained intact, thus marking a crucial development in Italy's low- and intermediate-level radioactive waste management.

Between Allies and Adversaries: Greece on the IAEA's Cold War Battlefield (1957-1961)
Loukas Freris, Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany.

Abstract: This paper examines Greece's efforts to secure a position on the Board of Governors of the International Atomic Energy Agency (IAEA) in its early years. The leadership of the Greek Atomic Energy Commission, driven by pride in the country's nuclear advancements and a perceived strong alliance with the United States, attended the IAEA's first General Conference in 1957 with high hopes. However, Greece quickly discovered that the diplomatic landscape within the IAEA was more complex than anticipated. Greek ambitions suffered a significant setback when the United States, rather than supporting Greece's candidacy, backed Turkey's application for the board position, amid tensions surrounding the unresolved Cyprus issue. This paper highlights the role of Cold War geopolitics in shaping the internal dynamics of the IAEA. In response to this diplomatic setback, Greece strategically adapted by forging relationships with other influential countries within the Western Bloc. By carefully navigating the power plays of multilateral diplomacy, Greece was able to secure a seat on the IAEA Board of Governors in 1961. The paper illustrates how the broader geopolitical context of the 1950s and 1960s Cold War influenced the diplomatic negotiations within the IAEA, emphasizing the intersection of national interests, international alliances, and nuclear governance. Through this case study, the paper sheds light on the challenges and strategies that shaped the development of the global nuclear order in the early Cold War period.

Radiation Stories: Living with the History of Atomic Testing in the US Midwest
Emily Yates-Doerr, Oregon State University, US.

Abstract: After a cancer cluster emerged in a small town in the US Midwest in the fall of 1954, community members began telling a story about red dust containing atomic fallout that had settled across their farmland the previous summer. Seventy years later, I draw on anthropological fieldwork with soil scientists, descendants of the community, and in public archives to explore the far-reaching geopolitical impacts of living with radiation. In some ways, my research challenges the oral history of the 1954 fallout event: community memory does not align with public atomic testing chronologies and passive gamma counting analysis of soil in the region has revealed only trace amounts of Cesium-137. Yet, the radiation stories told within the community continue to fuel skepticism about government protections, with past deception cited as an etiology of contemporary governmental distrust. Additionally, the presence of radiation—however slight—remains a lingering signal of harm. My fieldwork, conducted in an area not typically associated with nuclear testing, analyses the material-semiotics of radiation to illustrate the diffuse and persistent social fallout of atomic testing. Precisely because radiation is an absent presence, it has permeated daily life.

Between Detonations and Everyday Life: An Ethnographic Study of India's Nuclear Testing Site
Abhishek Saxena, Shiv Nadar University, India.

Abstract: Nuclear test sites are generally selected to minimise the fatal consequences of radiation fallout. But are there any perfectly suitable—isolated, barren, uninhabited—testing sites? How do societies living around the nuclear testing sites negotiate with the localised radioactive

contamination? How do they come to terms with being uprooted from lands inhabited for generations and separated from their local deities? Moreover, how does slow, constant exposure to radiation affect their philosophical conceptions of life? This paper, using ethnographic evidence, raises some of these questions and revisits conventional wisdom about the 'suitability' of India's nuclear testing site and official claims about no radiation fallout from the nuclear detonation conducted in 1974 and 1998. Drawing on oral histories from fieldwork conducted in the Pokhran town of the Jaisalmer district in Rajasthan, the paper reveals the forced migration and displacement behind the creation of a nuclear testing site. The Pokhran Test Range (PTR), where India conducted its nuclear tests, was once home to over thirty villages. In the late 1960s, the residents of villages such as Balana, Tadana, and Malka were relocated and displaced when the Indian government acquired their lands and agricultural fields for purposes unknown to them. Meanwhile, those who were spared from this postcolonial state-led nuclear site-making project—and who still live on the fringes of the test range—-continue to suffer from the health and environmental consequences of the tests, despite official claims of no radioactive contamination and underground nuclear tests are ostensibly safe.

Performative Demonstrations of Safety in the Face of Fear: From Fukushima to Phosphogypsum-Base Roads

Péter Marton, Institute of Global Studies, Corvinus University of Budapest, Hungary.

Abstract: Drawing on methodology designed for the multimodal discourse analysis of public performances carried out with a view to demonstrating the safety of various practices, along with findings from related research (Marton, Matura and Somogyvári, 2023), the paper explores what may be efficiency criteria for the impact of risk(lessness) communication on public perceptions of the dangers of radioactivity. To do so, it considers, firstly, Japanese Prime Minister Ishida's efforts to dispel fears over the safety of the consumption of seafood from the Fukushima area by having and sharing a public meal of sashimi in 2023, together with comparable historical instances of public demonstrations in other countries. Secondly, beyond the above review, it explores an additional case in the U.S. Environmental Protection Agency's documentation — including public comments received and the responses given — related to Mosaic Fertilizer, LLC's recently approved pilot project of phosphogypsum-base road construction in Florida. The discussion extends to epistemological issues, such as the question of what differences and similarities there may be between demonstrative performances, experiments, and pilot projects when viewed through the lens of performativity. The paper also addresses how geographical scale and political identities may factor into the critical geopolitics of the subject.

Harmful Memories of Lugol's Solution

Daniel Kikola, Warsaw University of Technology, Poland.

Abstract: The article "Harmful Memories of Lugol's Solution" examines the public's reaction to the Russian invasion of Ukraine on February 24, 2022, particularly the occupation of the Chernobyl Exclusion Zone on February 25, 2022. This event triggered widespread panic in Poland regarding potential ionizing radiation exposure, leading to a significant surge in the purchase of Lugol's solution - a potassium iodide solution historically used to block radioactive iodine uptake by the thyroid gland. The authors will highlight that this reaction is rooted in collective memories of the 1986 Chornobyl disaster, during which mass administration of Lugol's solution was implemented as a preventive measure. We emphasize that the contemporary rush to acquire Lugol's solution was unwarranted, as the increased radiation levels were localized and primarily due to the disturbance of contaminated soil by military activity, not a release of radioactive iodine. The article underscores the importance of effective science communication and the physicist community's role in dispelling misinformation during such crises. It calls for public education on

the specific applications and limitations of radiological protective measures to prevent unnecessary panic and ensure appropriate responses to radiation threats.

Radiobiology In-Between: The 1957 International Exhibition and Nuclear Congress in Rome

Donatella Germanese, Max Planck Institute for the History of Science, Germany.

Abstract: In 1957, Rome was the scene of intense political activity in relation to nuclear energy, such as the signing of the treaty of the European Atomic Energy Community (EURATOM) on March 25, which was followed the next day by the opening of a mobile atomic exhibition. During the summer, an international trade fair that also included a scientific conference program took place in Rome, the 4th International Electronic and Nuclear Energy Exhibition. The Soviet Union occupied the largest area of the nuclear show, followed by France, while the USA were absent. Nevertheless, five US scientists were sent to participate in the nuclear congress, among them radiobiologists Alexander Hollaender of the Oak Ridge National Laboratory and Leonidas D. Marinelli of the Argonne National Laboratory. Hollaender reported the results of several basic studies and encouraged the Italians to establish both basic and applied research in radiobiology. Marinelli explained how his team had discovered the worldwide contamination with Cesium-137 after nuclear explosions, assuring that it was only a very small dose in relation to natural background radiations. But the most explicit warnings of man-made ionizing radiations, also connected to the peaceful use of nuclear energy, were delivered by scientist Marcello Quintiliani of the Italian National Health Institute. This case study is based on archival documents, congress proceedings, and media coverage including photographs and films. My paper situates radiobiology and radiation protection in a complex Cold War setting between trade and science, politics and, somewhat surprisingly, religion.