



Nuclear Weapons Production, Control and Threat

Where have all our good minds gone?

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From the programme of this Symposium:

- Humankind faces **major challenges** that endanger our future and civilization as we know it.
- Global challenges for humanity include **sustainable development** and **global warming, energy, natural resources, pollution, clean water** and the uncontrolled development of **artificial intelligence**.
- Solving these problems requires scientific researchers, politicians and decision makers to talk and to listen to each other, and needs **scientists to raise public awareness**.

What about the nuclear threat?

Disarmament is an essential tool to secure the world and our future

UN SG Antonio Guterres

- Nuclear weapons continue to be a threat to humanity and to our planet.
- We call for urgent measures for the abolition of these tools of the annihilation of the human race and our environment.
- Constant dialogue is a powerful weapon (...), as trust and dialogue are integral parts of human dignity and a precondition for lasting peace and security.

Excerpts from the **Pact for the Future**

adopted at the Summit of the Future, 22 September 2024

Action 25: We will advance the goal of a **world free of nuclear weapons**.

- *We reiterate our concern over the **state of nuclear disarmament**.*
- *We recommit to the goal of the **total elimination** of nuclear weapons.*

Action 28: We will seize the opportunities presented by STI **for the benefit of people and planet**.

- *We will be guided by the principles of equity and solidarity, and promote the **responsible and ethical use** of STI.*

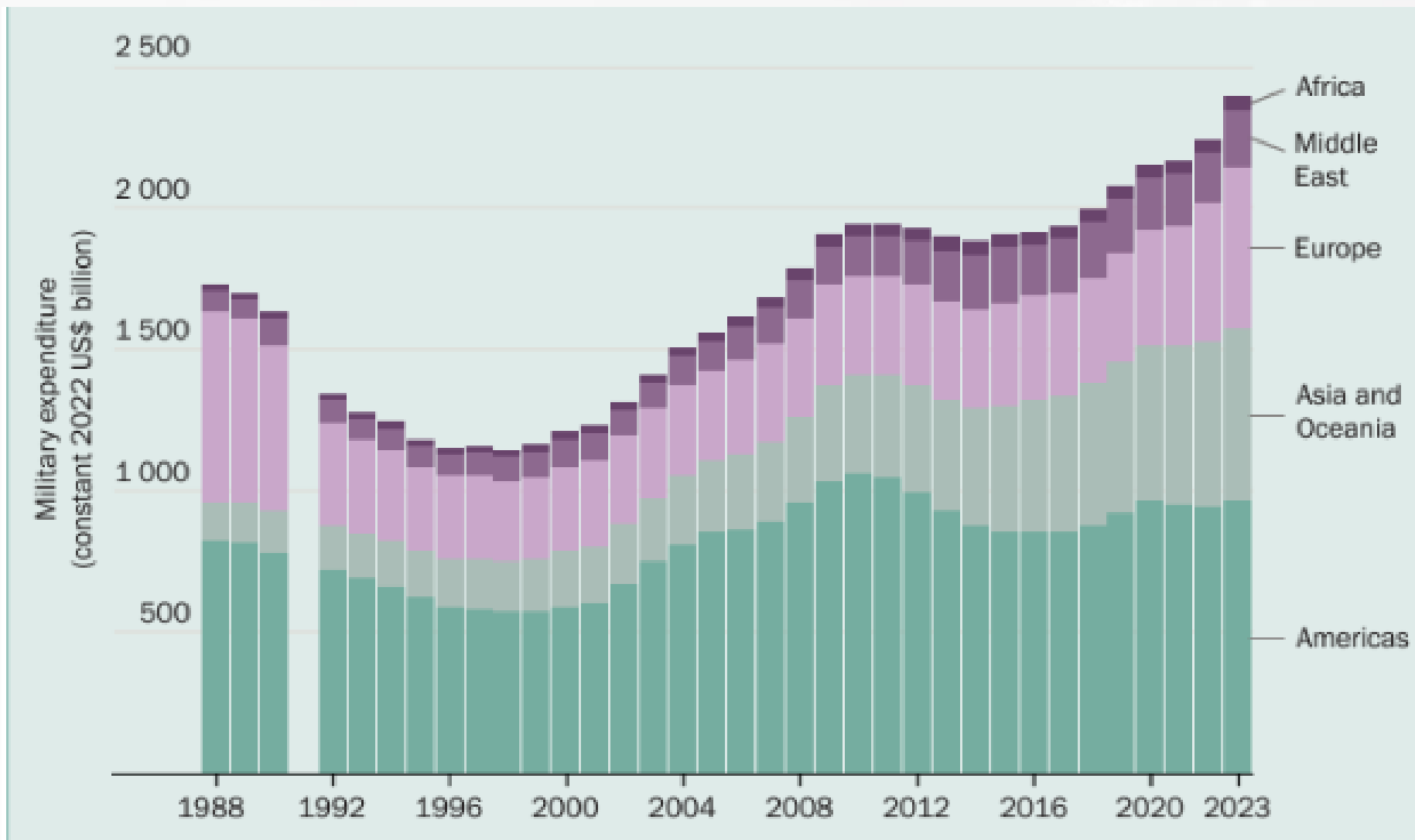
IUPAP and nuclear weapons

- IUPAP's mission is to assist in the worldwide development of physics, to foster international cooperation, and to help in the application of physics toward **solving problems of concern to humanity**.
- *IUPAP arose in the ashes of war.* *
- After WWII, the development and use of nuclear weapons **significantly changed the public image of physics**, and physicists were now seen as integral to state power and security. **
- However, throughout its first century of existence – and including the "difficult decade" of 1937-1947 – **IUPAP has kept its distance** from issues related to nuclear weapons.
- **None** of its 19 commissions or 4 affiliated commissions deal with the subject.

* R. Lalli, J. Navarro, *Nature* 16 Sept. 2024.

** *Physicists should not be merely seen cog(s) in the military machine.* P. Ewald, 1947.

The current landscape



World military expenditure by region, 1988-2023. Source: SIPRI, 2024.

The current landscape

- Nuclear efforts are being developed in one country to replace modern, accurate and effective bombs in so-called nuclear-sharing countries on other countries.
- Nuclear arsenals are being modernised and supplemented by powerful (conventional) long-range autonomous weapons with precise geolocalisation capabilities.
- The world expenditure in military S&T has benefited from a significant increase since 2014, to over USD 100 trillion (10^{11}) per year by 2023.
- One country alone spends at least USD 18 trillion on S&T and nearly USD 2 trillion on AI, all for military purposes.

When will we ever learn?*

* From the original song: Where have all the flowers gone? Pete Seeger (1955).

IUPAP Statement March 2022

- No scientist should be excluded from union-sponsored conferences, as long as he or she carries out work **not contributing to weapons development.**

100 years of international collaboration in physics*

- No scientist shall be excluded from the scientific community as long as their work is based **on ethics and the principles of science in its highest ideals** – an aspect that certainly will be further elaborated by the Working Group on Ethics (**WG18**).

* M. Pepe Altarelli and J. Vigen, CERN Courier, 8 Nov. 2022

WG18 2023 Review of existing codes of ethics

1. RESEARCH ISSUES

1. Ethical issues in funding agencies
2. Ethical issues in publishing
3. Predatory journals and Open Science

2. PHYSICISTS INTERACTING WITHIN THE SCIENTIFIC COMMUNITY

1. Ethical issues in research centers and universities
2. Ethical Issues in Scientific Organizations and Associations
3. Scientific Awards

3. PHYSICISTS INTERACTING WITH THE REST OF SOCIETY

1. Professional ethical issues
2. Science communication for all audiences
3. Ethical Decisions in Choosing a Research Area
4. UNESCO, Sustainability Policy
5. Political and consultant sphere

APS-sponsored project to engage physicists in reducing nuclear threat*

- *The main purpose is to develop ideas on **how the physics community can influence** the policies and postures of the nations that possess nuclear weapons.*
- *Physicists have a **special relation to nuclear weapons** – historically and technically. Thus, physicist's views - as citizen-scientists, not only as experts - can potentially have an influence.*

Stewart Prager, Princeton University.

* <https://www.aps.org/apsnews/2022/11/physicists-combat-nuclear-weapons>,
<https://www.ictp.it/news/2023/10/engaging-physicists-nuclear-disarmament>

Some WG18 considerations

- Ethical issues **evolve** and **new conflicts arise** as a result of
 - emerging technologies,
 - global challenges,
 - the spread of the malicious practices,
 - growing inequities, social distress, changing geopolitical landscapes, etc.,
 - which add to persistent issues.
- Ethical standards cannot be carved in stone but must be **critically reviewed** and kept up to date.

Proposal

IUPAP should consider establishing a permanent Ethics Committee to deal *i.a.* with issued related to nuclear weapons.

References

- UN Pact for the Future, September 2024.
www.un.org/sites/un2.un.org/files/sotf-the-pact-for-the-future.pdf
- SIPRI Military Expenditure Database. SIPRI, Stockholm, 2024.
<https://www.sipri.org/databases/milex>
- WG18 Report 2024, presented to IUPAP GA, October 2024.
- https://en.wikipedia.org/wiki/Where_Have_All_the_Flowers_Gone%3F