

Plenary Session Basic Science, Innovation and Policy

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[1. Introduction]

Dear colleagues and guests

Thank you for the kind introduction and for giving me the opportunity to participate in the panel. It is my first time to attend the the STS Forum in Kyoto as President of the German National Academy of Sciences Leopoldina and I would like to congratulate the STS forum on an excellent event.

In my talk, I would like to share insights from the European debate on the three guiding questions of this session. Let me start by underlining my key message:

In times of rapid technological change and geopolitical competition, international collaboration and basic science are more essential than ever.

[2. The Role of Basic Research]

First, on the role of basic research:

Many of the most pressing challenges — from climate change to AI governance or pandemic preparedness — are inherently global in nature. To tackle them, we need both: innovative solutions grounded in basic science and their translation into real-world applications.

The challenge today is not to choose between basic and applied science, but to combine them effectively, bridge the gap between them, and to prioritize both strategically.

Basic research — the pursuit of knowledge for its own sake — is the fertile ground from which transformative technologies emerge. Yet, this is increasingly being questioned:

Yes, we should accelerate the transfer of knowledge and innovation from basic research into application — especially in Europe. But this must not come at the expense of basic research itself. We need to foster both — not frame them as mutually exclusive.

Discoveries that seem abstract or irrelevant today can become the breakthroughs of tomorrow. That's why we must say it more clearly and more often:

Basic science and curiosity-driven research are essential — not only for scientific progress, but also for finding solutions to the complex challenges our societies face.

This conviction is central to a recent position paper published by the Leopoldina on innovation in Germany. There, we advocate a simple but powerful principle: “Set goals — leave paths open.”

Missions can provide orientation — but they must not constrain curiosity. Protecting academic freedom, ensuring research integrity, and securing long-term funding are all critical enablers of true innovation.

Technological leaps shorten the interval between discovery and application. But these opportunities can only thrive if basic research remains independent, interdisciplinary, robust and curiosity-driven.

[3. International Collaboration]

Second, on international collaboration:

Basic science depends on international collaboration. Basic science in national isolation is a dead end.

International cooperation is a key driver of scientific excellence. However, geopolitical tensions and security concerns are increasingly affecting research. While restricting collaboration with certain partners may serve science security, it also risks fragmenting science and reducing global inclusivity.

We need an international science policy that is open-minded — and realistic. It should follow the guiding principle: “As open as possible — as closed as necessary.”

This is what the Leopoldina together with the other G7-Academies reaffirmed in the “Ottawa Declaration” earlier this year: our shared commitment to academic freedom, institutional autonomy, research integrity, security, and the responsible conduct of research in support of the public good.

These values are the foundation of trust in global science — and, I would argue, also for democratic societies. I am convinced that science can build bridges where politics cannot.

[4. Supporting the Next Generation]

Last but not least, on the role of the next generation:

Science starts with curiosity. Early-career researchers need international opportunities and the freedom to pursue fundamental questions.

By encouraging curiosity today, we plant the seeds of tomorrow’s innovations. This is why, back in 2000, the Leopoldina supported the foundation of Die Junge Akademie — an academy for outstanding early-career researchers. We also host the administrative office of the Global Young Academy, further supporting scientific leadership worldwide.

Let me return to my earlier points: A strong focus on basic science, coupled with international collaboration, creates the ideal ground for nurturing scientific talent — in both basic and applied research.

[5. Conclusion]

Ladies and Gentlemen,

Our role as science academies is to provide independent, evidence-based advice to decision-makers and society — and to bridge the gap between knowledge and action.

In a world of rapid technological transformation, geopolitical tension, and complex societal challenges, the path forward is clear: Protect basic research. Foster international cooperation. Empower the next generation of scientists.

As Germany's National Academy of Sciences — and the oldest continuously existing academy of sciences in the world — the Leopoldina stands for independence, excellence, and dialogue.

By advancing knowledge and building bridges across borders and disciplines, science can contribute to a healthier, more resilient, and more sustainable future for all.

Let us recall the words of Abraham Flexner, a Leopoldina member in 1939, who famously described basic research as “the usefulness of useless knowledge.” Even seemingly “useless” findings today may become the basis for transformative innovation tomorrow.

Let science guide our choices — and inspire generations to come.

Thank you.

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