

## NEWS – Successful MATH+ project proposal “Schule@DecisionTheatreLab

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### **Berlin University Alliance (BUA) funds MATH+ project “Schule@DecisionTheatreLab” as an innovative format for science communication**

With its call for proposals on "Experimental Science Communication Laboratories", the Berlin University Alliance (BUA) aimed at the development and practical implementation of innovative formats for science communication.

#### **The Idea**

The successful project proposal **Schule@DecisionTheatreLab**, headed by Sarah Wolf (FU Berlin), was developed by a consortium of six members of the three Berlin universities and is based on the collaborative research of the Cluster of Excellence MATH+. **Schule@DecisionTheatreLab** combines two science communication formats: on the one hand, the format of **School Lab Workshops**, which offers lectures and workshops at schools to let students discover the exciting sides and the manifold reality references of mathematics; on the other hand, the **Decision Theatre**, a discussion format that visualizes potential impacts of alternative actions on screens, based on mathematical modeling, in support of discussions about societal challenges, such as Covid-19 or sustainable mobility. The project's basic idea is to bring **School Lab** (workshops) and **Decision Theatre** together in an experimental laboratory-based on MATH+ research topics. Both communication formats are carried out with school students and investigated from a mathematics-didactic and a social science perspective and thus continuously improved.

#### **The Background**

Mathematical modeling gained a great deal of attention as a result of Covid-19. However, the importance of mathematics and modeling for many other social issues and problems is less well known. To change this and demonstrate the relevance of mathematics for our lives and the future, mathematicians offer so-called **School Labs** with a mixture of workshops and lectures for school children.

The **Decision Theatre** is a communication format that uses mathematical modeling to support the discussion of societal issues. Groups of 5-25 participants discuss the respective topic with experts from science, politics, economy, and/or society, and the modelers themselves. Together, participants can experiment with models, for example, by assembling policies, such as different Covid-19 measures, into several scenarios and then exploring their different impacts using interactive visualization on large screens. This also shows how mathematical modeling can be applied to investigate social phenomena.

An initial **Decision Theatre** on sustainable mobility already exists, and the project **Schule@DecisionTheatreLab** will build on this. Here, policies under investigation include driving bans or the expansion of bicycle infrastructures, and simulations of an agent-based model show potential effects, e.g., in terms of mobility choices and resulting greenhouse gas emissions. Further Decision Theatres shall be set up with the help of other models developed in MATH+.

In parallel, the respective kind of mathematical modeling, e.g., agent-based modeling, is described and explained in **School Lab Workshops**. In the agent-based model on mobility, persons who take

mobility decisions are represented on the computer (as "agents"), together with their respective geographical environment and with their networks for information exchange. Then, the overall system's development is simulated by the many interactions of such "agents".

### **Aim and concept**

The project aims to experimentally establish and further develop the discussion format **Decision Theatre** as a communication tool to support and expand discussions about social phenomena and issues. At the same time, the communication shall help improve the models themselves. **Decision Theatres** can be applied and compared to different topics.

Based on the interdisciplinary and cross-institutional research of the Cluster of Excellence MATH+, **Decision Theatres** can be set up, for example, on the following topics:

- The spread of Covid-19 under different policy measures,
- Big Data, Machine Learning and Algorithms for Social Media Networks and their ethical aspects, and
- sustainable energy supply or sustainable mobility.

With their interactions, the participating groups influence the course and success of the Decision Theater. To research this, different groups will be compared. The aim is to investigate how the format of the Decision Theatre can best be further developed and thus successfully used in science communication. Since mathematics and STEM subjects are still an underrepresented female domain, special attention is paid to the topics of "gender and diversity". For example, it is about how Decision Theatres can be designed with the lowest possible gender bias, i.e., without gender-related distortion effects.

The project is funded for three years.

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