



ARNOLD SOMMERFELD  
CENTER FOR THEORETICAL PHYSICS



# Sommerfeld Theory Colloquium

**Wednesday, 14th July 2021**

at 16.15 h

**Prof. Harald Weinfurter**

(LMU Munich)

## **From Bell's theorem to Quantum Networks**

The question, whether a local, realistic theory can be a valid description of nature led to Bell's formulation of a clear cut experimental test. In spite of the many measurements performed and the numerous violation of Bell's inequality, all these tests relied on assumptions opening loopholes for local realistic theories. We present experiments which attempted to close as many as possible loopholes during the recent years, and what still might be left to do.

In the experiment, as Bell's inequality limits preshared knowledge about possible measurement results, it can be used on the one hand to now confirm random numbers deduced from measurement results or the security of the devices used for quantum key distribution. On the other hand we can use the techniques developed for this experiment as the basic link for future quantum networks distributing entanglement efficiently over larger distances.

via ZOOM

Ivo Sachs