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Towards an artificial muse for new ideas in Physics

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Artificial intelligence (AI) is a potentially disruptive tool for physics and science in general. One crucial question is how this technology can contribute at a conceptual level to help acquire new scientific understanding or inspire new surprising ideas. I will talk about how AI can be used as an artificial muse in physics, which suggests surprising and unconventional ideas and techniques that the human scientist can interpret, understand and generalize to its fullest potential. I will focus on AI for the design of new physics experiments, in the realm of quantum-optics and quantum-enhanced gravitational wave detectors as well as super-resolution microscopy. Finally I will discuss how algorithms with access to millions of scientific papers can predict and suggest future ideas for scientists.