On computer-inspired science

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Where do good ideas come from? As many scientists, I am wondering about this question for several years. After all, our ideas identify us as a researcher and – more importantly – are to a large extent responsible for the happiness in our professional endeavor. Here I will discuss two methods, how we can use computer algorithms to inspire new ideas for science – in particular in quantum physics.

One is based on the **automated design of new quantum experiments** [1]. For several years, we use computer algorithm to design novel quantum experiments, as our intuitions for complex quantum phenoma are limited [2,3]. Surprisingly, solutions found these computer algorithms have inspired new ideas for generating quantum entanglement that could have been identified by human scientists 25 years ago [4,5].

Secondly, inspired by fantastic work in the field of biochemistry [6], I am creating a rudimentary **semantic network of quantum physics** and use neural network to draw conclusions about its future evolution. I use 750.000 physics papers published by APS since 1919, and show attempts to suggest new unconventional personalized ideas in quantum physics.

I hope this talk inspires many enlightening discussion about what good, creative and unexpected ideas might be.

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