

# Hybrid human-machine learning in quantum physics and beyond

**J. Sherson**<sup>\*1</sup>

*1. Department of Physic and Astronomy, Aarhus University, Ny Munkegade 120, 8000 Århus C, Denmark*

Despite enabling impressive advances, the big-data driven deep learning paradigm has been challenged by AI scholars for not holding the potential to reach human scale intelligence. Instead, they propose studies of the human ability to reach heuristic solutions from little data as a basis for hybrid human-machine intelligence. An open question for the future of research is therefore how to design interfaces that allow for an optimal interaction between human intuition, complex machinery, and increasingly powerful ML.

In the [www.scienceathome.org](http://www.scienceathome.org) project, we have developed gamified interfaces allowing so far 250,000 players to contribute to research by providing insightful seeds for quantum optimization algorithms and remote access to our ultra-cold atoms experiment for amateur scientists, students, and researchers. Finally, I will discuss our effort to provide efficient, game-based heuristics for NP-hard computational problems related to spin glasses and ongoing efforts to demonstrate quantum supremacy using quantum annealing.

---

\*Corresponding author: [sherson@phys.au.dk](mailto:sherson@phys.au.dk)