Colloquium

Gain-based computing
with coupled light and matter

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Gain-based computing based on light-matter interactions is a novel approach to physics-based hardware and physics-inspired algorithms. In gain-based computing, the complex optimisation problems are encoded in the gain and loss rates of driven-dissipative systems. The system is driven through a symmetry-breaking transition on the changing loss landscape until a mode that minimises losses is selected, manifesting the optimal solution to the original problem. This process allows for solving important combinatorial optimisation problems via mapping to Ising, XY, and k-local Hamiltonians, emphasising the system's applicability across various physical platforms, including photonic, electronic, and atomic systems. In my talk, I will discuss and contrast different approaches to physical realisation of gain-based computing, the influence of phase space structures on system performance, and identify problems best suited for these unconventional computing architectures.

Wednesday, Oct 23rd, 2024 at 2:15 pm

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Am Fassberg 11, Göttingen, and
Zoom Meeting ID: 959 2774 3389
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