

## ■ Invited speaker

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## Towards fault-tolerant quantum computing with neutral atoms

### Abstract

Individually trapped and controlled neutral atoms offer a promising platform for quantum computing. We report on progress towards the realization of a programmable quantum processor based on encoded logical qubits in this system [1,2], and give an outlook for realizing fully error corrected codes in the future.

### References

- [1] Logical quantum processor based on reconfigurable atom arrays. D. Bluvstein, S.J. Evered, A.A. Geim, S.H. Li, H. Zhou, T. Manovitz, S.Ebadi, M. Cain, M. Kalinowski, D. Hangleiter, J.P. Bonilla Ataides, N. Maskara, I. Cong, X. Gao, P. Sales Rodriguez, T. Karolyshyn, G. Semeghini, M.J. Gullans, M. Greiner, V. Vuletić, and M.D. Lukin, *Nature* 626, 58–65 (2024).
- [2] High-fidelity parallel entangling gates on a neutral atom quantum computer. S. Evered, D. Bluvstein, M. Kalinowski, S. Ebadi, T. Manowitz, H. Zhou, S.H. Li, A.A. Geim, T. T. Wang, N. Maskara, H. Levine, G. Semeghini, M. Greiner, V. Vuletić, and M.D. Lukin, *Nature* 622, 268–272 (2023).

### About the Speaker

Vladan Vuletić is the Lester Wolfe Professor of Physics at MIT, and currently also serves as the Chair Elect of DAMOP and the Director of the NSF Frontier Center for Ultracold Atoms. He received his PhD from the Ludwig-Maximilians-Universität München in 1992. Research interests include laser cooling of atoms, quantum computing and simulation, quantum metrology and quantum optics. Vuletić is also co-founder of the Boston-based quantum computing company Quera Inc.