

# Lattice Boltzmann simulations across scales of fluid motion: classical, quantum and relativistic

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## ABSTRACT

For more than two decades, the Lattice Boltzmann (LB) method [1] has gained increasing interest as an efficient computational scheme for the numerical simulation of complex fluid problems across a broad range of scales, from fully-developed turbulence in complex geometries, to multiphase microflows, all the way down to biopolymer translocation in nanopores and lately even quantum-relativistic flows in quark-gluon plasmas and graphene. After a brief introduction to the main ideas behind the LB method, in this talk we shall illustrate a few selected applications, along with prospects for future multiscale application.

## REFERENCES

- [1] Succi, S. *The lattice Boltzmann equation: for fluid dynamics and beyond*. Oxford university press, 2001.