

# C'Nano 2020

The Nanoscience Meeting

## TOULOUSE

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### CV/ biography

CNRS Research Director since 1998, H el ene BOUCHIAT is working in Laboratory of Solid State Physics in Orsay (France). In 2005, she was awarded with CNRS silver medal for her work on quantum electricity. From 2007 to 2012, she was member of the evaluation panel on condensed matter Physics of the European Research Council (ERC). Since 2010, she is a member of French Academy of Science. Her research activity covers the study of electronic properties in mesoscopic physics including mesoscopic Quantum transport, Carbon Nanotubes, Graphene, Topological insulators.

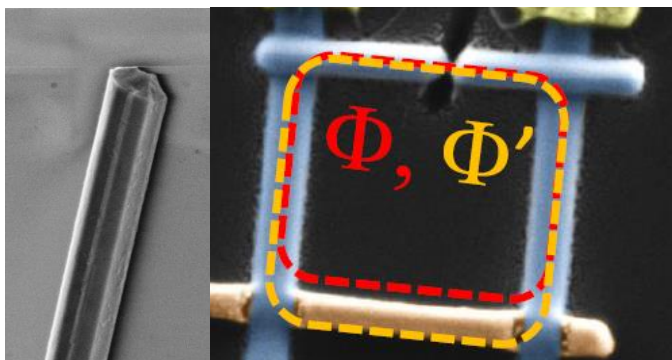
A. Bernard, A. Murani, B. Dassonneville, A. Kasumov, M. Ferrier, R. Deblock, S. Gu eron, and H. Bouchiat  
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### Revealing the topological nature of transport at mesoscopic scales with quantum interferences

We show that basic fundamental properties of mesoscopic quantum interferences can be used to reveal the existence and the physical location of 1d protected states in topological insulators. This method is illustrated in the case of crystalline bismuth nanowires which were found to belong to a class of newly discovered higher order topological insulators with helical ballistic hinge states coexisting with trivial bulk and surface diffusive states. In particular we discuss SQUID like periodic magnetic oscillations observed in Bi based Josephson junctions.

### References

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- [2] Frank Schindler *et al*, Nature Physics 14, 918–924 (2018).
- [3] A. Murani *et al*, Phys. Rev. Lett. 122, 076802 (2019).



**Keywords:**