

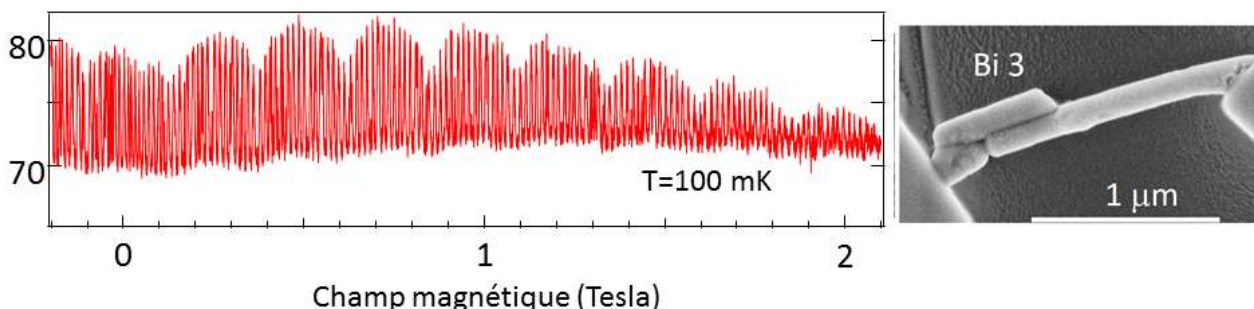
## Field-resistant quantum interference in bismuth nanowire-based Josephson junctions

# Sophie Gueron

I will present our work on the superconducting proximity effect induced in crystalline bismuth nanowires, a system with extremely high Rashba spin-orbit coupling. By connecting these nanowires to superconducting electrodes with very high critical field, we have explored the proximity effect over a broad magnetic field range, up to a regime in which the Zeeman energy reaches the spin-orbit and Fermi energies of the Bismuth wires.

I will go into some detail about the complex interference pattern displayed by the critical current as a function of magnetic field. I will argue that it is due to both spin and orbital degrees of freedom, and is the tell-tale sign of low dimensionality, phase coherent conduction regions interfering within the nanowires.

Courant critique (nA)



Oscillations du courant critique induit dans le nanofil de Bismuth contacté à deux électrodes en tungstène supraconducteur

Référence :

Magnetic field resistant quantum interferences in Josephson junctions based on bismuth nanowires  
Chuan Li<sup>1</sup>, A. Kasumov<sup>1,5</sup>, A. Murani<sup>1</sup>, Shamashis Sengupta<sup>2</sup>, F. Fortuna<sup>2</sup>, K. Napolskii<sup>3,4</sup>, D. Koshkodaev<sup>4</sup>, G. Tsirlina<sup>3</sup>, Y. Kasumov<sup>5</sup>, I. Khodos<sup>5</sup>, R. Deblock<sup>1</sup>, M. Ferrier<sup>1</sup>, S. Gueron<sup>1</sup> and H. Bouchiat<sup>1</sup>, [Phys. Rev. B \*\*90\*\*, 245427 \(2014\)](https://doi.org/10.1103/PhysRevB.90.245427).

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A coffee break will be served at 11h00. The seminar will be given in English.