

Seminário do Departamento de Física dos Materiais e Mecânica – FMT

“Electron quantum optics with graphene-based nanostructures”

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02 de maio, quarta-feira, Sala de Seminários José Roberto Leite

Edifício Alessandro Volta (bloco C), IFUSP, às 16h

Graphene nanoribbons (GNRs) are strong candidates as components in future nanoelectronics, since they incorporate some of the remarkable properties from graphene while are predicted to present a band gap.[1] More than a theoretical speculation, these structures can be fabricated nowadays via on-surface synthesis of chemically customized molecular precursors, reaching lengths up to 200 nm and free of defects.[2] This bottom-up method allows to precisely tune the GNRs electronic structure through structural control (edge structure and width)[3] and/or via chemical doping.[4-5] Together with these experimental breakthroughs a major effort has been devoted to the development of theoretical and computational methods to accomplish reliable quantum transport simulations. In this talk I will present an overview of our contributions in this field, including two prototypedevices: an electron analog of a Fabry-Perot resonator[4] and a tunable electronic beam splitter[6]. Our calculations illustrate the emerging picture of GNR-based materials as an ideal platform for electron quantum optics.

[1] L. Yang, C.-H. Park, Y.-W. Son, M. Cohen, and S. Louie., Phys. Rev. Lett. 99, 186801 (2007).

[2] J. Cai, P. Ruffieux, R. Jaafar, M. Bieri, T. Braun, S. Blankenburg, M. Muoth, A. Seitsonen, M. Saleh, X. Feng, K. Müllen, and R. Fasel, Nature 466, 470-473 (2010).

[3] N. Merino-Díez, A. Garcia-Lekue, E. Carbonell-Sanromà, J. Li, M. Corso, L. Colazzo, F. Sedona, D. Sánchez-Portal, J. I. Pascual, and D. G. de Oteyza, ACS Nano 11(11), 11661-11668 (2017).

[4] E. Carbonell-Sanromà, P. Brandimarte, R. Balog, M. Corso, S. Kawai, A. Garcia-Lekue, S. Saito, S. Yamaguchi, E. Meyer, D. Sánchez-Portal, and J. I. Pascual, Nano Letters 17(1), 50-56 (2017).

[5] E. Carbonell-Sanromà, J. Hieuille, M. Vilas-Varela, P. Brandimarte, M. Iraola, A. Barragán, J. Li, M. Abadia, M. Corso, D. Sánchez-Portal, D. Peña, and J. I. Pascual, ACS Nano 11(7), 7355-7361 (2017).

[6] P. Brandimarte, M. Engelund, N. Papior, A. Garcia-Lekue, T. Frederiksen, D. Sánchez-Portal, J. Chem. Phys. 146, 092318 (2017).

Dissertações e Teses de Doutorado

Dissertações de Mestrado

Leticia Zago

“Situações didáticas no ensino da relatividade geral: análise do engajamento dos alunos”

Comissão Examinadora:

Profª. Dra. Lúcia Helena Sasseron (orientadora – FE-USP),

Profª. Dra. Maria Inês Ribas Rodrigues (UFABC) e Prof. Dr.

Márlon Caetano Ramos Pessanha (UFSCar)

04/05/2018, sexta-feira, Auditório Novo II, Edifício Principal, IFUSP, às 14h

