

# Prototypes of Molecular Motors and Gears based on Aromatic Building Blocks

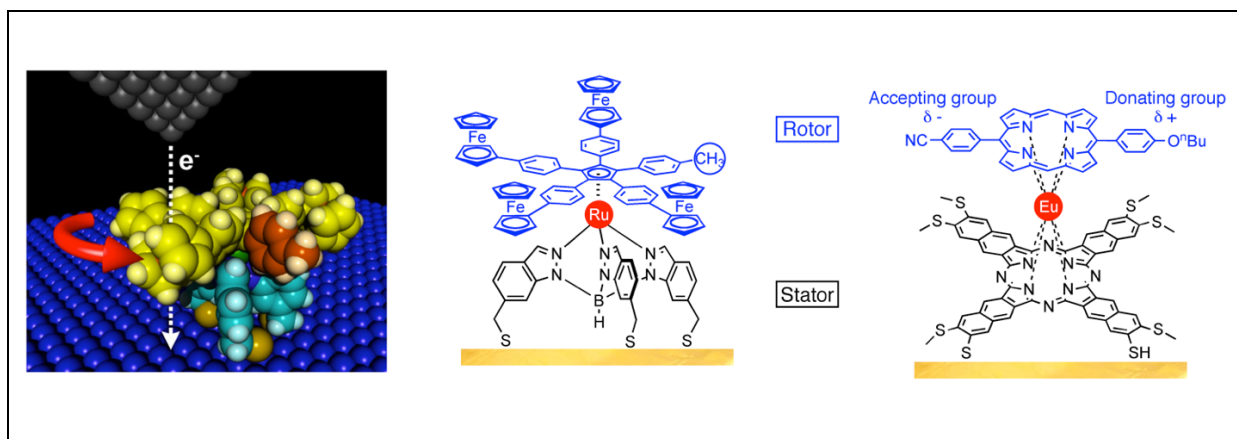
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Advances in the imaging and manipulation of single molecules by STM has stimulated much interest in the studies of technomimetic molecules,<sup>[1]</sup> molecules designed to imitate macroscopic objects at the molecular level, also transposing the motions that these objects are able to undergo.

In this presentation will be developed the design and synthesis of two molecular motors built around a ruthenium(II) or an europium(III) center. The ruthenium motor can be rotated in a clockwise or counterclockwise direction by selective electron tunneling through different sub-units of the molecule.<sup>[2]</sup> The europium rotor showed the synchronized rotation in a network on very long distances under the electric-field induced by the STM tip.<sup>[3]</sup> These complexes are also exploited as a central platform for molecular gears. Their design and synthesis will be also presented.



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2. Perera, U.G.E.; Ample, F.; Kersell, H.; Zhang, Y.; Echeverria, J.; Vives, G.; Rapenne, G.; Joachim, C.; Hla, S.-W. *Nature Nanotech.*, **2013**, *8*, 46.

3. Zhang, Y.; Kersell, H.; Stefak, R.; Echeverria, J.; Iancu, V.; Perera, U.G.E.; Li, Y.; Deshpande, A.; Braun, K.-F.; Joachim, C.; Rapenne, G.; Hla, S.-W. *Nature Nanotech.*, **2016**, *11*, 706.