

Abstract Submitted  
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**Remote Operation of a Nanovehicle Across Atlantic with an Atomic Scale Control.** SANJOY SARKAR, KYAW-ZIN LATT, Ohio University, YUAN ZHANG, Argonne National Laboratory, RYAN TUMBELESON, Ohio University, YANG LI, Argonne National Laboratory, MERSAD RAEISI, KONDOLORAO KOTTURI, KARTHIKEYAN PERUMAL, RAMIN RABBANI, ERIC MASSON, SAW-WAI HLA, Ohio University, CENTER FOR NANOSCALE MATERIALS, ARGONNE NATIONAL LABORATORY TEAM, DEPT. PHYSICS ASTRONOMY, OHIO UNIVERSITY TEAM, DEPT. OF CHEMISTRY BIOCHEMISTRY, OHIO UNIVERSITY TEAM — The ability to control at the atomic scale is vital for the advancement of nanotechnology. We have developed a molecular vehicle that can be driven on materials surfaces by an electrical energy supplied from a scanning tunneling microscope (STM) tip. Our nano-vehicle dubbed “Bobcat Nanowagon” is composed of an H shape frame with four Cucurbit[7]uril wheels attached. We used our Bobcat Nanowagon to enter the first international nanocar race held in France on 29 April 2017. The nano vehicles were deposited onto atomically clean Au(111) surface and they were driven by means of STM electric field across the Au(111) surface at 5 K substrate temperature. Moreover, we have competed the nanocar race by manipulating these nano vehicles remotely from France. This was the first time demonstration of atomic scale manipulation from one quarter of the globe distance, i.e. across Atlantic, and thus it was considered to be the world record. The nano vehicles can be driven by both positive and negative electric field. From the manipulation experiments, we determine the energy required to operate the nano vehicles as 800 meV.

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