

Abstract Submitted  
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**Nanomechanics of Graphene, Silicene and Boron Nitride ribbons:  
From honeycomb structure to atomic chains** MEHMET TOPSAKAL, SALIM  
CIRACI, UNAM - Institute of Materials Science and Nanotechnology — This first-  
principles study of elastic and plastic deformation of graphene, silicene and boron  
nitride (BN) honeycomb nanoribbons under uniaxial tension reveals interesting fea-  
tures. In the course of stretching, the electronic and magnetic properties can be  
strongly modified. Under plastic deformation, the honeycomb structure changes ir-  
reversibly and offers a number of new structures and functionalities. Interesting cage  
like structures, even suspended atomic chains, a truly one-dimensional system offer-  
ing unique mechanical, electronic and transport properties, can be derived between  
two honeycomb flakes. Present work elaborates on the recent experiments by Jin *et*  
*al.*, Phys. Rev. Lett. **102**, 205501 (2009) deriving carbon chains from graphene and  
furthermore predicts the similar formation of BN and Si atomic chains.

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