

Publication**Anomalous coiling of SiGe/Si and SiGe/Si/Cr helical nanobelts****JournalArticle (Originalarbeit in einer wissenschaftlichen Zeitschrift)****ID** 50430**Author(s)** Zhang, Li; Ruh, Elisabeth; Gruetzmacher, Detlev; Dong, Lixin; Bell, Dominik J.; Nelson, Bradley J.; Schoenenberger, Christian**Author(s) at UniBasel** [Schönenberger, Christian](#) ;**Year** 2006**Title** Anomalous coiling of SiGe/Si and SiGe/Si/Cr helical nanobelts**Journal** Nano Letters**Volume** 6**Number** 7**Pages / Article-Number** 1311-7

The fabrication of nanohelices by the scrolling of strained bilayers is investigated. It is shown that structure design is dominated by edge effects rather than bulk crystal properties such as the Young's modulus when the dimensions of the structures are reduced below 400 nm. SiGe/Si/Cr, SiGe/Si, and Si/Cr helical nanobelts are used as test structures. Dimensions of the belt width are reduced from 1.30 μm to 300 nm, and parameters controlling helicity angle, chirality, diameter, and pitch of the nanohelices are investigated. An anomalous scrolling direction deviating from the preferred $> 100^\circ$ scrolling direction has been found for small structures. Making use of the anomalous scrolling, it is possible to fabricate three-dimensional helices with helicity angles less than 45 degrees, which is advantageous for micro- and nanoelectromechanical systems.

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