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Curved Nanowire Structures JENS GRAVESEN, Mads Clausen nstitute, University of Southern Denmark, DENMARK, MORTEN WILLATZEN, Mads Clausen nstitute, University of Southern Denmark, DENMARK — Schroedinger eigenstates and associated eigenvalues are found and discussed in terms of symmetry properties for a quantum- mechanical particle confined to a curved nanowire having arbitrary cross-sectional geometry. The three-dimensional Schroedinger problem is simplified mathematically using differential-geometry arguments so as to obtain three ordinary differential equations which can be solved computationally fast even for complex-curved nanowire structures. This simplification is possible as long as the nanowire radius of curvature is considerably larger than the nanowire cross- sectional dimensions. We consider in details the computational problems of a straight nanowire with two subsequent 90 degree bendings, the sinusoidal-shaped nanowire, the elliptical-shaped nanowire based on the analytical fact that the model presented gives exact (excellent) agreement with the corresponding three- dimensional treatment in the cases of a nanowire with a straight-line shaped (circular-shaped) axis.

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