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Defect-Induced Magnetism in Wide-gap Semiconductor Nanowires: Role of Surface Effects and Quantum Confinement[1] PRATIBHA DEV, Physics Dept., University at Buffalo, PEIHONG ZHANG, Physics Department, University at Buffalo — Observation of unconventional magnetism in undoped wide gap semiconductors, most notably in nanostructures and thin films, has attracted much research attention. While the fundamental mechanism remains under debate, there is increasing evidence that surface/interface and/or localized defect states are responsible for the observed magnetism. Nanowires offer a unique 1D-environment where many phenomena – confinement and surface effects–play a crucial role. We have studied defect-induced magnetism in wide-gap semiconductor nanowires using density functional theory based *ab-initio* methods. Quantum confinement and the surface effects are shown to play a crucial role in the enhancement of the defect-induced magnetism.

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