

### Motivation

Bottom-up fabrication approaches will provide a solution to the size limitation of top-down approaches. Our approach of using nanowire (NW)-based heterostructures is promising for future optical and electronic nanodevices.

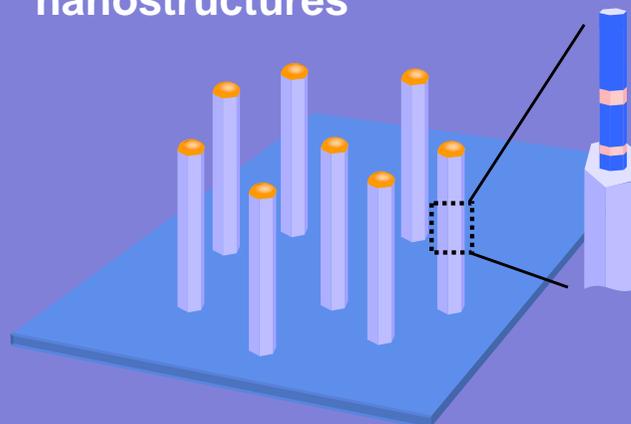
### Originality

Core nanowires are grown by the metallic-particles-catalyzed vapor-liquid-solid (VLS) method. Novel three-dimensional structures can be formed by combining the axial VLS mode and radial vapor phase epitaxy mode.

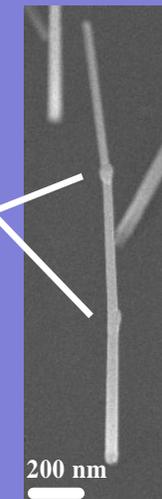
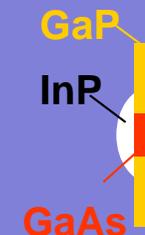
### Impact

Various functional nanodevices that can't be achieved by conventional fabrication techniques will be provided. New optical devices for quantum information processing or quantum computing are expected.

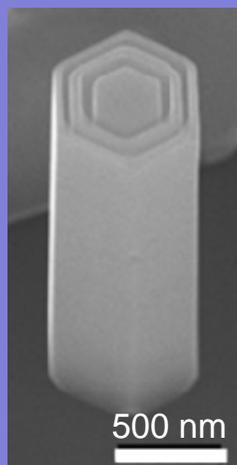
### Diagram of NW-based nanostructures



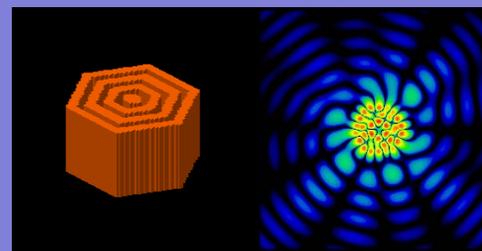
### InP nodes



### Core-multishell NWs with air gaps



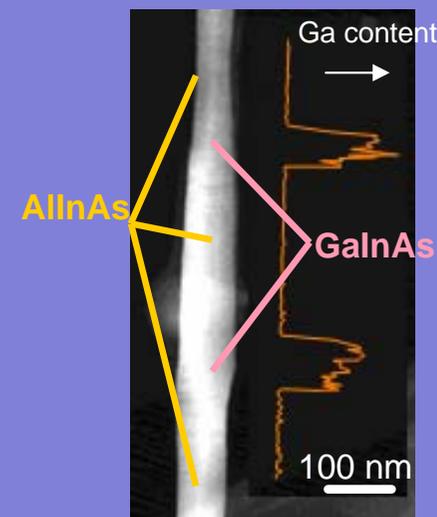
### 3D-FDTD simulation



$$Q=2770$$

$$V=0.8 (\lambda/n)^3$$

### GaInAs quantum dots



Sharp interfrance <6nm

