

Integration of Multifunctional Nanotechnology on a Single-Chip

Ratanak Heng

Department of Electrical Engineering, University of Maryland – College Park

UNIVERSITY OF MARYLAND

RD Vispute, Shiva Hullavarad, and T. Venkatesan

ARMY RESEARCH LAB

Stephen Kilpatrick, Alma Wickenden, Matthew Ervin, and Barbara Nichols



MOTIVATION

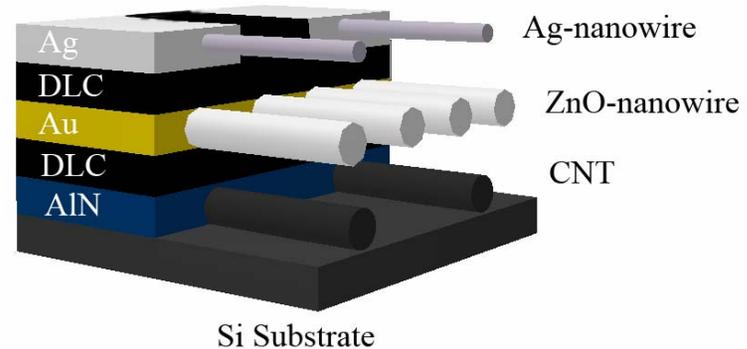
Integrate different nanostructures on monolithic devices

- Carbon Nanotubes
- ZnO Nanowires
- Ag Nanowires

APPROACH

Lateral growth of nanostructures from thin film sidewalls.

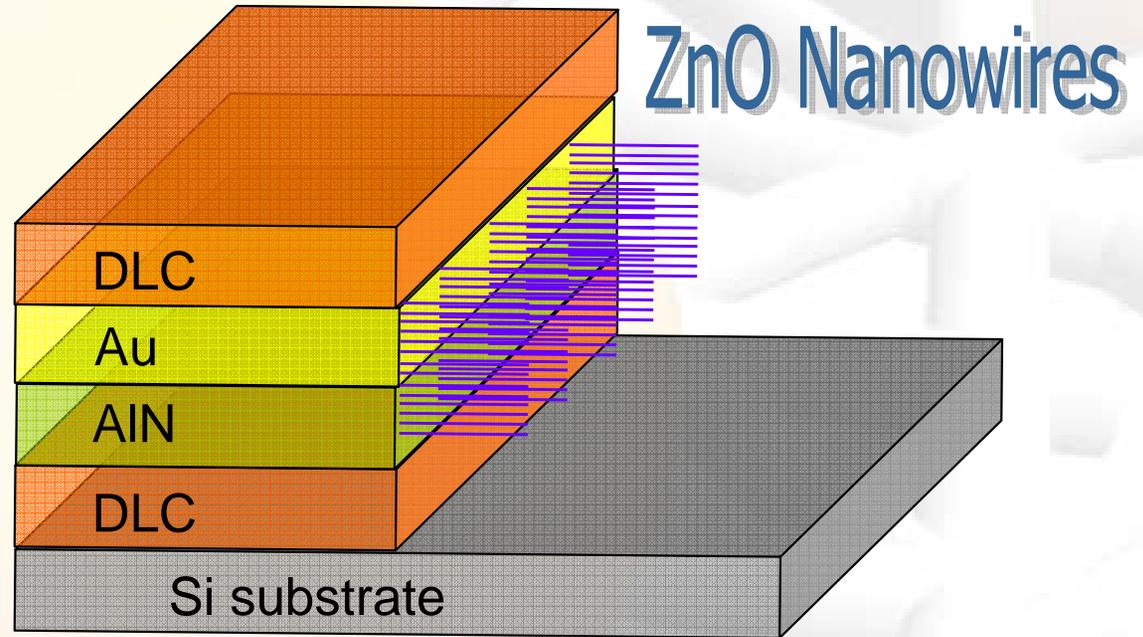
➤ ZnO Nanowires



Thin Film Architecture

GOALS

Masking layer →
Catalytic layer →
Masking layer →

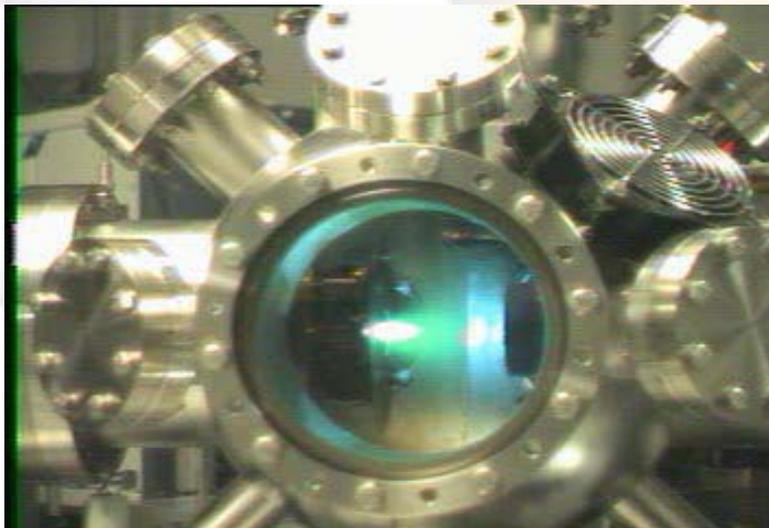


1. Identify catalytic thin films
2. Optimize synthesis of ZnO
3. Achieve laterally directed ZnO nanowires

METHODS

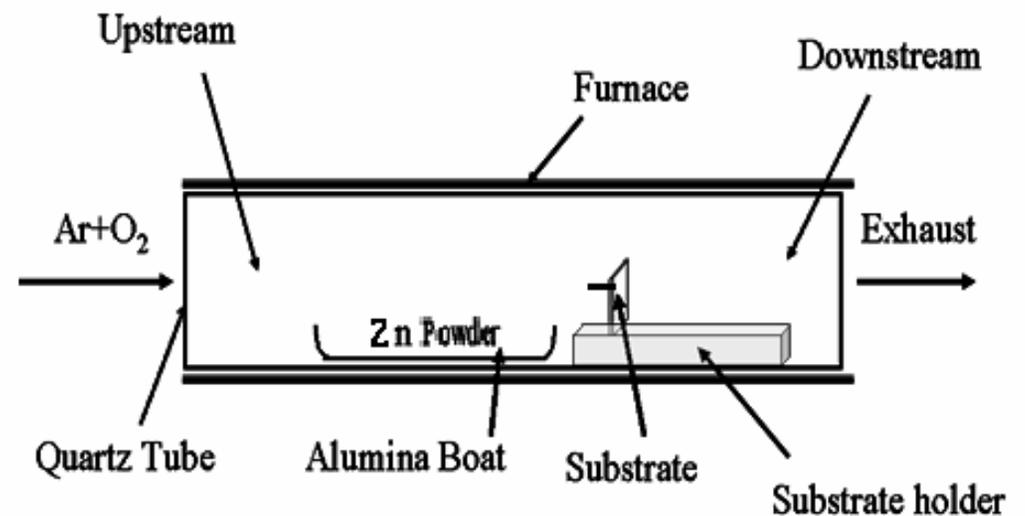
Thin Film Fabrication

- *Pulse laser deposition*
- *Au, AlN, BN, DLC, Zn, AlN/Au*



ZnO Nanowires Synthesis

- *Catalyst-free vapor transport*
- *Temperature, gas flow rate & ratio*





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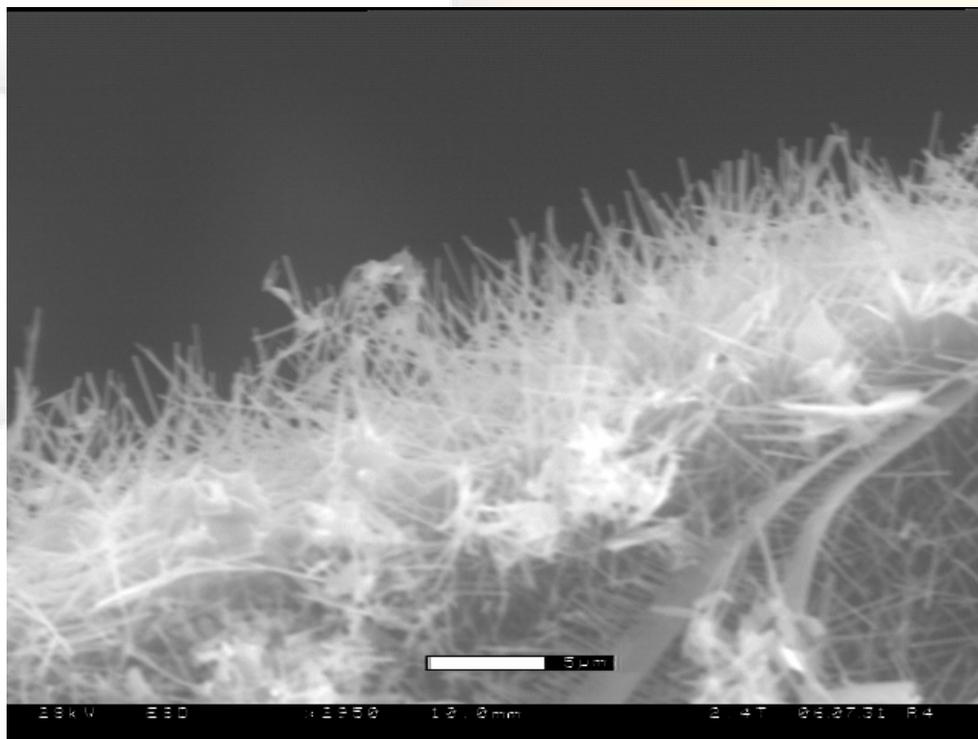
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CONCLUSION

1. Nucleation & masking layer identified
2. Synthesis conditions of ZnO examined
3. Directed growth observed



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