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III-Nitrides, 2D Materials, 1D Nanowires:

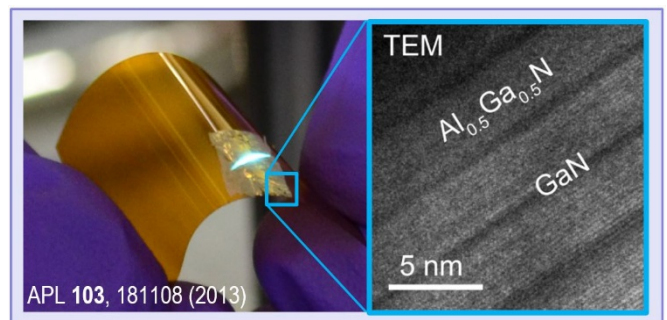
A zeroth order summary of semiconductor optoelectronics at TIFR



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I will present an overview of research in the area of semiconductor optoelectronics at TIFR Mumbai with a focus on a few specific areas of current interest: III-nitride materials, graphene and transition metal dichalcogenides, and III-V semiconductor nanowires. We are a small group working on the epitaxial growth of materials by MOVPE, optical spectroscopy of semiconductors, and novel device structures. I will highlight some recent work on semipolar nitrides, where we are investigating the growth and anisotropic optical properties of (11-22) oriented AlGa_{0.5}N and AlInN alloys [1]. We have also grown III-nitride semiconductors on layered materials like CVD graphene [2], WS₂ and MoS₂ [3]. Recently, we have synthesized high-quality ReS₂ and ReSe₂ materials, which have interesting layer-thickness independent optical properties [4]. In the area of nanowires, our recent work has been on the mechanism of the growth of Ni-catalyzed GaN nanowires [5], and on understanding the bandgap of wurtzite GaP nanowires. We also fabricate single nanowire transistor and resonator structures for measurements of electro-mechanical properties.



References

- [1] N Hatui et al., J. Cryst. Growth 437, 1 (2016); J. Cryst. Growth 411, 106 (2015)
- [2] P Gupta et al., J. Cryst. Growth 372, 105 (2013)
- [3] P Gupta et al., Sci. Reports 6, 23708 (2016)
- [4] B Jariwala et al., Chem. Mater. 28, 3352 (2016)
- [5] CB Maliakkal et al., Nano Lett. 16, 7632 (2016)