

## Shanthi Iyer

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### Professional Preparation

*Delhi University, Delhi, India Physics B.Sc. 1974*  
*Delhi University, Delhi, India Physics M.Sc. 1976*  
*Indian Institute of Technology, Delhi, India Physics Ph.D 1983*

#### **A. Appointments**

*2010- Present* Joint Faculty, Nanoengineering, Joint School of Nanoscience and Nanoengineering, Greensboro, NC  
*2006- Present* Research Professor, Dept. of Electrical and Computer Engineering, NC A&T SU, Greensboro, NC  
*1997 – 2005* Professor, Dept. of Electrical Engineering, NC A&T SU, Greensboro, NC  
*1991 – 1997* Associate Professor, Dept. of Electrical Engineering, NC A&T SU Greensboro, NC  
*1986– 1991* Assistant Professor, Dept. of Electrical Engineering, NC A&T SU, Greensboro, NC  
*1981 – 1985* Adjunct Assistant Professor, Dept. of Electrical Engineering, NCA&T SU, Greensboro, NC

#### **B. Recent Publications(out of 58)**

1. Manish Sharma, Md Rezaul Karim, Pavan Kasanaboina, Jia Li, and Shanthi Iyer, "Pitch-Induced Bandgap Tuning in Self-Catalyzed Growth of Patterned GaAsSb Axial and GaAs/GaAsSb Core-Shell Nanowires using MBE" *Crystal Growth & Design* 17, 307 (2017) (DOI: 10.1021/acs.cgd.6b01577).
2. Estiak Ahmad, S.K. Ojha, P.K. Kasanaboina, C. L. Reynolds Jr., Y. Liu and **S. Iyer**, " Bandgap Tuning in GaAs<sub>1-x</sub>Sb<sub>x</sub> Axial Nanowires Grown by Ga-Assisted Molecular Beam Epitaxy ", *Sem. Science & Tech.*32, 035002 (10 pp) (2017).
3. Estiak Ahmad, Pavan Kasanaboina, Md Rezaul Karim, Manish Sharma, C.L. Reynolds Jr., Yang Liu and **Shanthi Iyer**, "Te Incorporation in GaAs<sub>1-x</sub>Sb<sub>x</sub> Nanowires and P-I-N Axial Structure", *Sem. Science & Tech.*31, 125001(8pp) (2016).
4. Sai Krishna Ojha, Pavan Kumar Kasanaboina, C Lewis Reynolds.Jr, Thomas A Rawdanowicz, Yang Liu, Ryan M White and **Shanthi Iyer**, " Incorporation of Be Dopant in GaAs Core and Core-Shell Nanowires by Molecular Beam Epitaxy", *J. Vac. Sci. Technol. B* 34(2), 02L114-1 - 02L114-6(2016).
5. Pavan Kasanaboina, Manish Sharma, Prithviraj Deshmukh, C.L. Reynolds Jr., Yang Liu, **Shanthi Iyer**, "Effects of Annealing on GaAs/GaAsSbN/GaAs Core-Multi Shell Nanowires", *Nanoscale Research Letters* 11(1), 1-6 (2016) DOI: 10.1186/s11671-016-1265-4.
6. Pavan Kumar Kasanaboina, Sai Krishna Ojha, Shifat Us Sami, Lewis Reynolds, Yang Liu and Shanthi Iyer, "Effect of Growth Parameters and Substrate Surface Preparation for High Density Vertical GaAs/GaAsSb Core-Shell Nanowires with Photoluminescence Emission at 1.3  $\mu\text{m}$ ", *Journal of Electronic Materials*, 45(4) 2108-2114 (2016) (DOI: 10.1007/s11664-015-4316-1).
7. Pavan Kumar Kasanaboina, Estiak Ahmad, Jia Li, Lewis Reynolds, Yang Liu and **Shanthi Iyer**, "Self-Catalyzed Growth of Dilute Nitride GaAs/GaAsSbN/GaAs Core-Shell Nanowires by Molecular Beam Epitaxy", *Appl. Phys. Lett.* 107, 103111 -5(2015).
8. Pavan Kumar Kasanaboina, Sai Krishna Ojha, Shifat Us Sami, C. Lewis Reynolds Jr., Yang Liu and **Shanthi Iyer**, "Bandgap Tuning of GaAs/GaAsSb Core-Shell Nanowires Grown by Molecular Beam Epitaxy", *Semiconductor Science and Technology*, 30, 105036(10pp) (2015).

9. Ngoc Nguyen, Briana McCall, Robert Alston, Ward Collis, and **Shanthi Iyer**, "The Effect of Annealing Temperature on the Stability of Gallium Tin Zinc Oxide Thin Film Transistors" *Sem. Sci. Tech.* 30, 105004 (2015).
10. Pavan Kumar Kasanaboina, Sai Krishna Ojha, Shifat U. Sami, Lewis Reynolds, Yang Liu and **Shanthi Iyer**, "Tailoring of GaAs/GaAsSb core-shell structured nanowires for IR photodetector applications", *Proc. SPIE* 9373, Quantum Dots and Nanostructures: Synthesis, Characterization, and Modeling XII, 937307 (February 27, 2015); doi:10.1117/12.2080572.
11. Robert Alston, **Shanthi Iyer**, Tanina Bradley, Jay Lewis, Garry Cunningham and Eric Forsythe, "Investigation of the effects of deposition parameters on indium-free transparent amorphous oxide semiconductor thin-film transistors fabricated at low temperatures for flexible electronic applications", *SPIE OPTO*, 90050D-90050D-10., 25<sup>th</sup> Feb 2014, San Francisco, CA.
12. **S. Iyer**, L. Reynolds, T. Rawdanowicz, S. Krishna Ojha, P. Kumar Kasanaboina and A. Bowen; "A Study of Ga Assisted Growth of GaAs/GaAsSb Axial Nanowires by Molecular Beam Epitaxy". Chapter 3 *Nanoscience and Nanoengineering: Advances and Applications*, Ajit D. Kelkar, Dan Herr and James G. Ryan; CRC Press.: Boca Raton FL, ISBN 978-1-4822-3119-9, pages 31-49 (2013).
13. N. Patra, S. Bharatan, J. Li, and **S. Iyer**, "Annealing Studies of Heteroepitaxial InSbN/ GaAs Grown by MBE for Long Wavelength Infrared Detectors", *J. Appl. Phys.* 083107 (2012).
14. N. Patra, S. Bharatan, J. Li, M. L. Tilton and **S. Iyer**, MBE, "Growth and Characterization of InSb<sub>1-x</sub>N<sub>x</sub> on GaAs for LWIR Applications", *Journal of Applied Physics*, 111, (08) 2012.
15. S. Bharatan, **S. Iyer**, J. Li, L. Reynolds and T. Rawdanowicz, "A Study of MBE Grown InGaAsSbN/GaSb Single Quantum Wells", *J. Vac. Sci. Technol. B*, 29, 03C112-(1-6) (2011)
16. L. Wu, **S. Iyer**, K. Gibson, J. Li K. Matney, J. Reppert, A. M. Rao, and J. Lewis, "A Study of Low-Temperature Growth of III-V Alloys for Transparent Layers", *J. Vac. Sci. Tech. B*, 27, 2375-2383 (2009).
17. Kalyan Nunna, **S. Iyer**, L. Wu, J. Li, S. Bharatan, X. Wei, R. T. Senger, and K. K. Bajaj, "Nitrogen Incorporation and Optical Studies of GaAsSbN/GaAs Single Quantum Well Heterostructures" *J. Appl. Phys.* 102, 053106 (2007).
18. S. Bharatan **S. Iyer**, K. Matney, K. Nunna, W. J. Collis, J. Reppert, A. M. Rao and P. R. C. Kent, "The Effects of Annealing on the Structural, Optical and Vibrational Properties of Lattice-Matched GaAsSbN/GaAs Grown by Molecular Beam Epitaxy" *J. Appl. Phys.* 102, 023503 (2007)
19. **S. Iyer**, L. Wu, J. Li, S. Potoczny, K. Matney and P. R. C. Kent, "Effects of N Incorporation on the Structural and Photoluminescence Characteristics of GaSbN/GaSb Single Quantum Wells", *J. Appl. Phys.* 101, 113508-13 (2007).

#### **E. Synergistic Activities**

1. Initiated and developed NCA&TSU's Molecular Beam Epitaxy (MBE) Laboratory, associated research program and educational component. (1994 - current)
2. Director of the Center of Excellence for Battlefield Capability Enhancements (2004-2010) funded by Army Research Office, with focused on developing technologies for environmentally stable flexible panel displays. Has been responsible for developing the associated synthesis, testing and fabrication laboratories for amorphous oxide thin film transistors in collaboration with Research Triangle Institute International Inc. Also collaboratively developed and delivered a "Display Technology" course at an undergraduate cum graduate level providing a broad overview of information displays.
3. Graduate level courses have been developed and offered regularly on "Thin Film Technology for Device Fabrication", "Compound Semiconductor Materials and Devices", and "Fundamentals of Nanoengineering: Physical Principles".
4. DoD National HBCU/MI Committee Member (2010) to assess HBCU's participation in their educational and research programs.
5. Outstanding Senior Researcher Award -2006/7 (NCA&TSU and College of Engineering) and Excellence in Research in College of Engineering Award-1993 (NCA&TSU).

#### **F. Post Graduate Students Advised (45) and Currently Supervising (9)**

**G. Postdoctoral Researchers Sponsored (5):** Jia Li, Sudhakar Bharatan, Tanina Bradley, Liangjin Wu and Jie Li.