Dr. N. SATHISH
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SUMMARY: Energetic, innovative resourceful researcher with strong organizational and communication skills delivering optimum results at every stage, having five years of experience in performing advanced multidisciplinary research in science and engineering, Expertise includes:

- Additive Manufacturing of Graphene polymer composites
- Graphene , Graphene Oxide and Graphene Composite Materials
- Monte Carlo and Molecular Dynamics simulations
- Radiation Damage, Stopping powers and Ion solid interactions
- Dielectric function theory of stopping powers
- Numerical techniques and Statistical Analysis

ANALYTICAL SKILLS AND MANAGEMENT QUALITIES

- A pragmatic and analytical approach to problem-solving.
- Demonstrated original, independent and critical thinking.
- Using reasoning skills, apply analytical skills and grasp complex problems.
- Ability to bring new ideas, curiosity and innovative approach to the organization
- Create mathematical model, Interpret and present information graphically.
- Effectively using specialist software packages and programming.
- Setting of research goals, intermediate milestones and prioritization of activities.
- Break down tasks down to their basic elements.
- Listen, give and receive feedback and respond perceptively to others
- Summarize, document, report and reflect on my progress
- Constructively defend research outcomes at seminars and viva examination

RESEARCH EXPERIENCE

- **Senior Scientist :** Advanced materials and Processes Research Institute, Bhopal, India Since 26.09.2014 to till date
- **Starszy specjalista inz.-tech (Senior Eng-tech)**: Institute of Electronic Materials Technology (ITME), Warsaw Poland, since 02.05.2013 to 20.04.2014.
- **Adiunkt (Assistant Professor)**: Institute of Electronic Materials Technology (ITME), Warsaw Poland, since 01.05.2010 to 31.03.2013.
- **Assistant**: Nation Centre for Nuclear Studies (NCBJ) 05-400 Swierk, Otwock, Poland, 19.05.2010 to March 2012.
- **Ph.D thesis** titled "Ion beam modification of GaN based Semiconductor Heterostructures" 2010.
- **M.Phil Project:** Study of Ag_2O-MoO_3 glass structure by Molecular Dynamics simulations. (2001-2002)

ACADEMICS

- PhD in Physics**, School of Physics, University of Hyderabad, (2010)**
- M.Phil in Physics**, Dept of Physics, Pondicherry University (Dec 2002)**
- M.Sc in Physics**, Dept of Physics, Pondicherry University (April 2001)**

Ongoing project

- Additive manufacturing of advanced micro lattice structures made of graphene composite materials , Sponsoring agency : CSIR, Major Lab project , **PI : Dr N. Sathish, Period : Aug 2015 – Aug 2018**

PROFESSIONAL EXPERIENCE

Advanced Materials and Processes Research Institute, Bhopal, India

- Additive Manufacturing of Graphene composite materials
- 3D printing of graphene composite materials based components
- Growth of graphene on Cu foils by chemical vapour deposition
- Molecular dynamics simulation of interface properties of graphene to polymer matrix

Institute for Electronic Materials Technology, Warsaw, Poland

- Graphene and graphene oxides materials by chemical routes and Raman characterization
- Developed Monte Carlo code for RBS/Channelling analysis. Developed mathematical model for dislocation distortions.
- Raman measurements and Raman Mapping of III-Nitrides epitaxial multilayer.
- High Resolution X-Ray analysis of III-V & III-Nitride epitaxial multilayer for solar cell and LED applications.
- Used Mathematica for analytical modelling, GPA for strain mapping of TEM images and Delphi, C++ for Monte Carlo programming.
- This simplified modeling allows us to model dislocation in personal computer, generally requires large clusters.
- Sigma Plot, Excel, Word, Power Point, Origin for preparing the report and presentations.

University of Hyderabad, Hyderabad, India

- Understanding the interaction of energetic particles with compound semiconductor materials.
- GaN, AlGaN/GaN heterostructures, MQWs and Er implanted GaNs.
- High resolution XRD (HRXRD), RBS/Channeling (RBS/C), Atomic Force Microscopy (AFM) and Photo Luminescence (PL) has been use to characterize the materials.
- Calculations of stopping power of GaAs using dielectric function theory and optical data model.

Journal Publications (papers 34, h-index :7, citations : 76)

https://www.researchgate.net/profile/Sathish_Natarajan
http://scholar.google.co.in/citations?user=LxBAvJMAAAAJ

Recent publications on Graphene/Graphene oxide

1. "2D materials-challenges and opportunities in graphene commercialization", Invited talk in National seminar on Emerging trends in Materials and processing technology, Nov 2014, AMITY University, Gwalior.
2. "Combined liquid phase and thermal exfoliation of graphite to graphene ribbons", M Aksienionek, M Łepecki, N Sathish, L Lipińska, presented in Graphene Week 2014, 23rd -27th June 2014, held in Gothenburg, Sweden
3. "Preparation and characterization of reduced graphene oxide deposited on Si/SiO2 wafer by rod coating technique", R. Koziński, L. Dobrzański, K. Librant, N. Sathish, A. Kozłowski, J. Jagiełło, K. Góra, L. Lipińska. Present in Graphen 2013 conference, 23rd – 27th April , Bilbao , Spain

RESEARCH

Summary of Experience in the area of material preparation characterization

- Additive manufacturing of graphene composite materials
- Graphene and graphene oxide by LPE, CVD and chemical routes
- Raman spectroscopy (Raman and Raman Mapping)
- Structural properties (High resolution X-ray Diffraction, XRD)
- Micro structural properties (SEM, AFM and TEM)
- Optical properties (PL, optical Transmittance, Reflectance, refractive index ,band gap)

Experience in the handling of the sophisticated and advance instruments

- Confocal Micro Raman & Mapping (HORIBA Jobin Yvon LABRAM HR800 with three laser sources at University of Hyderabad, Renishaw inVia Raman microscope, ITME, Poland)
- High resolution XRD (Philips Materials Research Diffraction meter at TIFR, Mumbai, India ; Burker D8 at University of Hyderabad ; Home made setup at ITME, Poland)
- Atomic force microscope (Seiko SPI -400 at University of Hyderabad, India)
- Rapid Thermal Annealing (ANNEALSYS, AS-One)
- RBS and channelling, NRA and PIXE (at IGCAR kalpakkam and IUAC, New Delhi , India ; IPJ, Poland)
- Irradiation and implantation (at IGCAR kalpakkam and IUAC, New Delhi , India)
- Handling and maintenance of ultra High vacuum systems (diffusion pumps and turbo molecular pump based)
- Hands on experience on UVH beam lines and HV chambers and goniometer
- XTEM and TEM sample preparations
- RF sputtering systems (TORR, RF magnetron sputtering system at University of Hyderabad)
- Spectrophotometer & Fluorescence spectrometer (made setup using ocean optics spectrometer and light sources and filters)

COMPUTERS/ PROGRAMMING SKILLS:

- Very good in developing algorithms and programming methodologies.
- Languages: 8 years of experience in programming languages like C, C++, Delphi and Visual Basic.
- Mathematical Packages: Expertise in Mathematica and Matlab.
- Operating systems: Expertise in Windows and Linux.
- Parallel programming: having working knowledge on MPI, OpenMP and P-Threads. Working experience in IBM SMP machines & Sun Blade Workstations, Apple clusters.
- Course: Advanced diploma in client server technology (one year course) which covers C, C++ with OOPS, UNIX, Visual Basics, Power Builder for front end programming and Oracle with SQL for backend.
- Have developed and maintained website using CMS (Plone) and CSS for IBA-2007 and ISJPS-2010, Hyderabad, India.
- Have experience in setting up NIS and NFS cluster in Debian Linux
- Radiation damage & Stopping power and RBS analysis packages : SRIM, TRIM, CasP, simNRA & McChasy
- Developed Monte Carlo code and developed and implemented simplistic dislocation model defect studies.