**Shyam Kumar**
**Supervisor: Prof. Raghava Varma**
**Indian Institute of Technology Bombay**
**Specialization: Experimental High Energy Physics**
**e-mail: shyam055119@gmail.com**

**Physics**
**Dual Degree (M.Sc. + Ph.D.)**
**Male**
**DOB: 06-03-1990**

**Thesis Title**: Growth, Characterisation and Simulation for using diamond as a detector material in HEP Experiments and $D^+$-hadron correlation in p-Pb collisions at 5.02 TeV CM energy in ALICE

| Examination | University | Institute | Year | CPI/% |
|---|---|---|---|---|
| Post Graduation | IIT Bombay | IIT Bombay | 2018 | 7.70 |
| Graduation | DayalBagh Educational Institute, Agra | DayalBagh Educational Institute, Agra | 2008 | 76.4 |
| Intermediate/+2 | A.R.R.N.A. Inter college, Bah, Agra | A.R.R.N.A. Inter college, Bah, Agra | 2005 | 71.6 |
| Matriculation | A.R.R.N.A. Inter college, Bah, Agra | A.R.R.N.A. Inter college, Bah, Agra | 2003 | 68.16 |
| B.Ed | DayalBagh Educational Institute, Agra | DayalBagh Educational Institute, Agra | 2010 | 7.60 |

## Exams Qualified

2012 Joint Entrance Screening Test (JEST-2012)

2015 **National Eligibility Test (NET-2014)**

## Scientific Activity

Since 2010, after my selection for integrated Ph.D course via the JAM, I am involved in scientific research activities. I report a summary of the last 6 years of research activity from my masters onwards:

2012-2017 Growth of **Single Crystal and polycrystalline diamond film** by MPCVD process in Laboratory

2014-2017 **Microwave Plasma simulation** and design of resonant cavity for the growth of diamond film

2014-2017 Comparison of **Radiation damage for Si,Ge, GaN and Diamond** using simulation package FLUKA

2012-2016 Experience in ROOT geometry writing and visualization of detector geometries and creating animations

2015-2016 Six months service task done in ALICE on Coding convention checker using Static Analysis Suite package based on Clang and LLVM compiler coding

2016 Inclusion of **Photon Multiplicity Detector (Indian detector) and FOCAL (Forward Calorimeter) in ALICE Event Display**, by creating a simplified geometry and also made the animation

2016-2017 Characterisation of diamond film by using current voltage characteristics and **Transient Current Technique (TCT) measurement**

2015-2017 **$D^+$ Hadron correlation in p-Pb collisions** at 5.02 TeV CM Energy in ALICE

2012-2014 **Simulation, Digitization, Material Budget and Event display of START detector in PANDA Experiment** based on double sided strips diamond sensors

## Research Visits

2017 Two Month CERN visit for taking shifts in data taking in ALICE experiment and Analysis work

2016 Two Month CERN visit for the completion of Service task on Coding Convention Checker for ALICE O2 project

2015 42 Days CERN visit for doing service task, Photon Multiplicity Detector shifts in ALICE Control Room and Analysis work

2013 Three months Visit to Forchungszentrum, Germany for Simulation Of START Detector Based On Diamond in PANDA Experiment

## Software Experience

Languages: FORTRAN, MATLAB,BASH SCRIPT, C/C++

Data Analysis: ROOT, PANDA ROOT, ECLIPSE, ALIROOT, GEANT and FLUKA

Others: Linux, Windows, Highscore Plus, Origin Pro, COMSOL, **Computer Simulation Technology (CST) [mostly used for Accelerator Designing]**

## Schools, Workshops and Conferences

Aug-Sep 2017 Selected in "2017 CERN- Fermilab HCP Summer School", CERN with **funding support**

March 2017 Working as **"Junior representative** of ALICE India Collaboration Group"

Feb 2017 Selected for **"Young researcher grants"** in Advanced Detectors for Nuclear, High Energy and Astroparticle Physics, Kolkata (Feb 2017)

Dec 2015 27th RD50 Workshop on **Radiation hard semiconductor devices** for very high luminosity colliders, CERN

Jan 2013 SERC School on Nuclear Matter under Extreme conditions, VECC, Kolkata, India

May-June 2011 Selected in Summer Students Visiting Programme **(SSVP-2011)** in Institue of Physics, Bhubaneshwar, India

May - June 2007 Selected in Mathematics Training and Talent Search **(MTTS-2007)** Programme held in Panjab University Chandigarh, India

## Academic Activity

2014-2016 Supervised and evaluated Undergraduate and Masters level nuclear physics and instrumentation lab course for 3 semester at IIT Bombay

2015 Supervised summer students on growth of Diamond film and characterisation

2014 Supervised and evaluated undergraduate and masters level Condensed matter physics lab for two semester at IIT Bombay

2013 Supervised and evaluated Undergraduate first year lab for a semester at IIT Bombay

2012 Supervised and evaluated Preparatory lab course for a semester at IIT Bombay

2012 Supervised and evaluated Electronics lab Analog and Digital for two semester at IIT Bombay

## Poster and Presentations

Talk "Diamond as the future material for High Energy Physics Experiments", "NSPDI-2017", TIFR, Mumbai, India (October 2017)

Talk "Comparison of Silicon, Germanium and Diamond sensors for Using it in HEP Detector Applications", "Advanced Detectors for Nuclear, High Energy and Astroparticle Physics", Kolkata, India (Feb 2017)

Poster "Comparison of Si, Ge and Diamond Sensors as Trackers in Collider Experiments, DAE-HEP, organised at Delhi University, India (2016)

Poster "Comparative Study of Radiation damage in Si, Ge and Diamond used as Detector", Proceeding of DAE Symp. on Nucl. Phys. 61 (2016), organized in SINP, Kolkata, India

Talk "Diamond as the future material for Detector Applications in HEP", SYMPHY organized in IIT Bombay, Mumbai, India (2015)

Poster "Material budget study for Lambda disks with Silicon and Diamond sensors in PANDA Experiment", in DAE-HEP organized in IIT Guwahati, India (2014)

Talk "Growth of Diamond film by MPCVD Process for Detector Applications", in DAE-HEP organized in IIT Guwahati, India (2014)

Poster Fabrication and Characterization of Diamond Radiation Detector as an Alternative to Silicon Detectors, Proceedings of the DAE Symp. on Nucl. Phys. 58 (2013), organized in BARC, Mumbai, India

Poster Growth of Diamond by MPCVD Process, Proceedings of the DAE Symp. on Nucl. Phys. 58 (2013),organized in BARC, Mumbai, India

Talk "Semiconductor Detectors", 2nd DST-SERC School organized at VECC Kolkata, India (2013)

## Publications

1. "Measurement of azimuthal correlations of D mesons with charged particles in pp collisions at $\sqrt{s} = 7$ TeV and p-Pb collisions at $\sqrt{s_{NN}} = 5.02$ TeV", ALICE Collaboration, Published in Eur.Phys.J. C77 (2017)

2. "D-meson production in p-Pb collisions at $\sqrt{s_{NN}} = 5.02$ TeV and in pp collisions at $\sqrt{s} = 7$ TeV", ALICE Collaboration, Published in Phys.Rev. C94 (2016)
3. "D-meson production versus multiplicity in p-Pb collisions at $\sqrt{s_{NN}} = 5.02$ TeV", ALICE Collaboration, Published in JHEP 1608 (2016)