



## Dr. Pradeep Kumar Maharana, Ph.D.

**Name:** Pradeep Kumar Maharana

**Designation:** Assistant Professor (Physics)

**Department:** Department of Basic Science and Humanities  
(JOINED THE INSTITUTE IN 2007)

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### RESEARCH INTERESTS

Theoretical modeling and simulation of Graphene plasmonics, plasmonic based high performance chemical and biosensor, Quantum plasmonics (plasmonic solar cell, high frequency photonics circuits and quantum controlled devices such as single photon source, transistors and ultra compact circuits at nanoscale).

### Academic Qualifications

Ph. D. (Physics), Indian Institute of Technology Bhubaneswar, Odisha, India

M.Tech.(Solid State Materials), Indian Institute of Technology Delhi, New Delhi, India

M. Sc. (Physics), Fakir Mohan University, Odisha, India (Gold medalist)

Specialisation: Solid State Physics and Photonics

### Teaching Experience/Industrial Experience/Research Experience

1. Assistant Professor, Silicon Institute of Technology Bhubaneswar, Odisha (AUG 2007-DEC 2010 & AUG 2014-Till Date)
2. Senior Lecturer, Mahavir Institute of Engineering and Technology, Bhubaneswar, Odisha, India (July 2005-June 2007)

## PUBLICATIONS

### JOURNALS:

- [1]. Pradeep K. Maharana and R. Jha, "Chalcogenide prism and graphene multilayer based surface plasmon resonance affinity biosensor for high performance", **Sensors and Actuators B** **169**, 161–166 APRIL (2012). ISSN- 0925-4005.
- [2]. Pradeep K. Maharana, T.Srivastava and R. Jha, "Ultrasensitive plasmonic imaging biosensor based on graphene and silicon", **IEEE photonics Technology letters**. **25(2)**, 122-125 JAN (2013). ISSN- 1041-1135.
- [3]. Pradeep K. Maharana, S.Bharadwaja and R. Jha, "Electric field enhancement in surface plasmon resonance bimetallic configuration based on chalcogenide prism", **Journal of applied physics**, **114(1)**, 014304-1-4, JULY 2013. ISSN- 0021-8979.

- [4]. **Pradeep K. Maharana**, R.Jha and S.Palei, "Sensitivity enhancement by air mediated graphene multilayer based surface plasmon resonance biosensor for near infrared", **Sensors and Actuators B** **190,494-501(2014)**.
- [5]. **Pradeep K. Maharana**, T.Srivastava and R.Jha, "Low index dielectric mediated Surface Plasmon Resonance Sensor Based on Graphene for Near Infrared measurements", Journal of physics D:Applied Physics, 47, 385102 (11pp)AUG (2014),ISSN- 0022-3727.
- [6]. **Pradeep K. Maharana**, P.Padhy and R.Jha, "On the field enhancement and performance of an ultra stable SPR biosensor based on graphene",**IEEE photonics Technology Letters** **25(22), 2156-2159, NOV 2013**.
- [7]. **Pradeep K. Maharana**, T.Srivastava and R.Jha, "On the performance of highly sensitive and accurate graphene-on-aluminum and silicon based SPR biosensor for visible and near infrared", **Plasmonics**, **9, 1113-1120 APRIL (2014) ISSN- 1557-1955**.
- [8]. **Pradeep K. Maharana**, R. Jha and P. Padhy, "On the electric field enhancement and performance of SPR gas sensor based on graphene for visible and near infrared", **Sensors and Actuators B** , **207,117-122 OCT (2015)**.
- [9]. Jeeban Kumar Nayak, **Pradeep K. Maharana** and R.Jha, "Dielectric over-layer assisted graphene, its oxide and MoS<sub>2</sub>-based fibre optic sensor with high field enhancement", Journal of physics D:Applied Physics,50(40), SEPT 2017, 405112 (10pp).

#### CONFERENCES:

- [1]. **Pradeep K. Maharana**, T.Srivastava and R.Jha, "Surface plasmon resonance imaging biosensor based on graphene multilayer", Proceedings of International Conference on Fiber Optics & Photonics, 9<sup>th</sup>-12<sup>th</sup> December 2012, IIT Madras, Chennai, India.
- [2]. S. Bharadwaja, **Pradeep K. Maharana**, R.Das. and R. Jha, "Effect of chalcogenide glass and plasmonic metal on electric field enhancement in surface plasmon resonance sensor", Proceedings of International Conference on Fiber Optics & Photonics, 9<sup>th</sup>-12<sup>th</sup> December 2012, IIT Madras, Chennai, India
- [3]. **Pradeep K. Maharana** and R.Jha, "Plasmonic biosensor based on graphene multilayer", Proceedings of 37<sup>th</sup> OSI symposium, 23<sup>rd</sup> -25<sup>th</sup> January 2013, Pondicherry University, India.
- [4]. **Pradeep K. Maharana**, S.Palei and R.Jha, "Graphene based long range surface plasmon resonance sensor for near infrared", Proceedings of 37<sup>th</sup> OSI symposium, 23<sup>rd</sup> -25<sup>th</sup> January 2013, Pondicherry University, India.
- [5]. **Pradeep K. Maharana** and R.Jha, "Graphene based plasmonic biosensor for near infrared", Proceedings of National seminar on recent trend in laser and photonics and 30<sup>th</sup> Convention of Orissa physical society, 9<sup>th</sup> - 10<sup>th</sup> February, 2013.
- [6]. **Pradeep K. Maharana** and R.Jha, "Enhancing the performance of SPR sensor through electric field enhancement using graphene" Work shop on recent advances in photonics WRAP 2013, 17-18<sup>th</sup> December 2013, Indian Institute of Technology Delhi, New Delhi, India.

- [7]. **Pradeep K. Maharana** and R.Jha, "Sensitivity Enhancement of Graphene on AI based SPR Biosensor by improving the Electric Field Intensity", International conference on optics & optoelectronics (ICOL-2014), Instruments Research & Development Establishments (IRDE), Dehradun,Uttarakhand,05-08 March 2014.
- [8]. **Pradeep K. Maharana**, T.Srivastava and R.Jha, "Low loss surface plasmon excitation in graphene based dielectric-metal-dielectric configuration", in Proceedings of International Conference on Fiber Optics & Photonics, 13<sup>th</sup>-16<sup>th</sup> December 2014, IIT Kharagpur, India.
- [9]. **Pradeep K. Maharana**, T.Srivastava and R. Jha, "Graphene based Low loss surface plasmon resonance biosensor in visible", International Conference on Optics and Photonics(ICOP-2015), February 20-22, 2015, Department of Applied Optics and Photonics, University of Calcutta, INDIA.

## ANY OTHER

Book Chapter and  
Conference attended

## CONFERENCES ATTENDED

- [1]. International Conference on Fiber Optics & Photonics, 9<sup>th</sup>-12<sup>th</sup> December 2012, IIT Madras, Chennai, India.
- [2]. 37<sup>th</sup> Optical Society of India symposium, 23<sup>rd</sup> -25<sup>th</sup> January 2013, Pondicherry University, India.
- [3]. National seminar on recent trend in laser and photonics and 30<sup>th</sup> Convention of Orissa physical society, Ravenshaw University, Odisha 9<sup>th</sup> - 10<sup>th</sup> February, 2013.
- [4]. Work shop on recent advances in photonics WRAP 2013, 17-18<sup>th</sup> December 2013, Indian Institute of Technology Delhi, New Delhi, India.
- [5]. International conference on optics & optoelectronics (ICOL-2014), Instruments Research & Development Establishments (IRDE), Dehradun,Uttarakhand,05-08 March 2014.
- [6]. International Conference on Fiber Optics & Photonics, 13<sup>th</sup>-16<sup>th</sup> December 2014, IIT Kharagpur, India.
- [7]. International Conference on Optics and Photonics(ICOP-2015), February 20-22, 2015, Department of Applied Optics and Photonics, University of Calcutta, INDIA.