# Dr. Rishi Maiti

**Post-Doctoral Scientist, Gaeta Lab/Lipson Nanophotonics Lab, Columbia Nano Initiative, Columbia University**

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## Research Interest

- 2D materials based on-chip photonics
- Straintronics in photonics
- Quantum optoelectronics
- Optical interconnects
- PCM based reconfigurable photonics
- Nonvolatile photonic memory
- Tunnel junction based optoelectronics
- Van der Waals Heterostructures

## Technical Expertise & Software Skill

| | |
|---|---|
| Deposition & Growth | 2D material exfoliation (micro-mechanical & Liquid phase exfoliation, 2D printer, Pick n drop transfer)<br>CVD growth, Wet & Dry transfer of 2D materials, MBE, Sputtering (DC & RF), ALD, PLD & PECVD |
| Device Fabrication | E-beam, ion beam & thermal evaporation, spin & dip coating<br>Electron Beam Lithography, Focus-ion beam Lithography, Photo |
| Characterization | lithography, wet & dry etching process<br>optical characterization (absorption, PL measurement- PL decay, PL excitation spectroscopy, PL imaging, EL & photo-current measurement, Raman spectroscopy)<br>surface characterization- AFM, SEM, TEM, XRD<br>Electrical characterization- Hall resistivity, mobility, magnetoresistance, I-V & C-V, High speed device characterization |
| Optical Components | Lumerical FDTD/Device/Mode/Interconnect, COMSOL |
| Image Processing | Mathematica, Origin, AutoCAD, Photoshop |
| Programming | C, C++ |

## Employment, Internship & Teaching experience

- George Washington University, Post-Doctoral Fellow, Washington D.C. **1/11/2017-Present**
  Research area includes: nanophotonic devices, Electro-optic modulator, optical interconnect, novel materials, plasmonics & metamaterials, Tunnel junction & Smart window, ITO based optical modulator & switch
- University of Brescia, Research Internship, Brescia, Italy **1/1/2016-30/06/2017**
  Research area includes: photonic sensor devices, novel materials, chemical sensors, single NW transistors for sensing applications
- As a teaching assistant, I have taken tutorial classes for B. Tech 1st year students for one semester (3 lectures per week for Physics-1 course) at the Dept. of Physics, IIT Kharagpur. (1 semester)
- I acted as a laboratory instructor for B. Tech students at the Dept. of Physics, IIT Kharagpur. (4 semesters)
- As a teaching assistant, I acted as a laboratory instructor (Condensed matter Physics Lab) for postgraduate students (Lateral M. Sc.), Department of Physics, IIT Kharagpur. (3 semesters).
- As a teaching assistant, I acted as a laboratory instructor (Nuclear Lab) for postgraduate students (Lateral M. Sc.), Department of Physics, IIT Kharagpur. (1 semester)
- As a teaching assistant, I acted as a laboratory instructor (Electronics Lab) for postgraduate students (Lateral M. Sc.), Department of Physics, IIT Kharagpur. (1 semesters)
- S. N. Bose National Centre for Basic Sciences, summer intern, Kolkata, India 5/2011-7/2011

## Educational Background

| | | |
|---|---|---|
| 20/7/2012 – 06/08/17 | Ph.D. | **Indian Institute of Technology Kharagpur (IIT-KGP)**<br>Department of Physics<br>**Thesis Title:** Studies on hybrid graphene nanostructures for optoelectronic devices **Supervisor**: Prof. S. K. Ray<br><br>Visiting Student under Erasmus Mundus LEADER<br>Sensor Lab, Department of Information Engineering,<br>**University of Brescia, Italy** |
| 22/07/2010 – 06/06/12 | M Sc | **Indian Institute of Technology Kharagpur (IIT-KGP)**<br>Department of Physics<br>Major in Physics (8.75/10.00)<br>Thesis Advisor: Dr. Prof. S. K. Ray |

| | | |
|---|---|---|
| 18/06/2007 – 15/07/10 | B Sc | **Ramakrishna Mission Vidyamandira**<br>**University of Calcutta,** West Bengal, India<br>Physics Hons. (75.63%, 1st Class) |

## Scholastic Honours & Awards

| | | |
|---|---|---|
| 2020 | OSA | Jean Bennett Student Travel Grant |
| 2019 | IEEE | IEEE Young Professional Travel Grant |
| 2019 | NSF | NSF Travel Grant |
| 2019 | MRS | Postdoc Hardship Registration Grant for 2019 MRS Spring Meeting |
| 2017-20* | GWU | Post-Doctoral Fellowship |
| 2016-17 | European Union(EU) | Erasmus-Mundus LEADER Fellowship |
| 2014-15 | MHRD, Govt. of Ind | Senior Research Fellow |
| 2012-14 | MHRD, Govt. of Ind | Junior Research Fellow |
| 2007-12 | DST, INSPIRE, Govt. of Ind | INSPIRE Scholarship |
| 2012 | UGC-CSIR | National Eligibility Test (**NET**) qualified |
| 2012 | MHRD | Graduate Aptitude Test for Engineers (**GATE**) qualified |

## Professional Society membership

| Society | Member Since | Membership Type |
|---|---|---|
| Material Research Society (MRS) | 2016 | Student Member |
| Society of Photographic Instrumentation Engineers (SPIE) | 2017 | Student Member |
| Optical Society of America (OSA) | 2018 | Student Member |
| IEEE photonics society | 2019 | Student Member |

## Journal Reviewer

Thin solid film (Elsevier)
Scientific Reports (Nature Publishing Group)
ACS Photonics (ACS)

Nano-Photonics (De Grutyr)
Material Research Express (IOP)
Sensor (MDPI).

## Research Outline

Modern computer architectures require efficient interconnects with low power dissipation and large signal bandwidth. Traditional electrical interconnects are not up to the mark due to their limited bandwidth, cross-talk, and signal distortion etc. Optical interconnects could offer a promising solution to this challenge. Therefore, we need Efficient on chip photonic components like electro-optic modulator and detector. My research is primarily focused on heterogeneous integration of two-dimensional (2D) layered materials, with highly tunable properties for next generation efficient nanophotonic devices.

**During PhD**, My Research was primarily focused on how to enhance the light-matter interaction of graphene since the absorption of graphene is less and it is also a zero band gap materials. So, the idea is to couple more light to graphene and also to get the selectivity in the photodetection by opening the band gap. So, during my course of PhD work, I have tried several steps like i) controlling the degree of reduction to tune the band gap, ii) to integrate with noble metallic NPs to use LSPR effect iii) integrating graphene with photonic crystal microcavity iv) graphene nanostructures and also try to fabricate v) Van Der Waals heterostructures to improve the performance of graphene photodetector.

## Research Project

Strain engineered 2D materials for integrated photonic devices 1/1/2019-present

- To study the strain engineering in 2D materials
- Understanding the tunability of physical properties as a function of strain
- Design and fabrication of strain tunable optoelectronic devices

Optical Modulation based on 2D atomic layered materials 1/11/2017 – present

- The goal of this project is to build a highly functional electro-optic modulator/detector based on TMDs integrating them on Si-photonic chip.
- Explore the mechanism behind the modulation in terms of role of exciton for the TMDs material.
- Study the interaction between TMDs and Si photonic devices and determination of index at 1.55 um.

Integration of 2D materials on SiN platform 1/3/2018 – Present

- To study the enhance light-matter interaction in 2D materials
- Active modulation of 2D material emission by all optical approach
- Study QCSE in hetero-bilayer structure

Optoelectronics based on hybrid graphene nanostructure 01/06/2013 – 31/01/2017

- Studied graphene oxide (GO) based p-n heterojunction for broadband efficient CMOS compatible photodetector.
- The fabricated vertical GO/n-Si heterojunction diode shows a very low leakage current density of 0.25 μA/cm$^2$ and excellent rectification characteristics upto 1 MHz.
- The device on illumination shows a broadband (300 nm-1100 nm) spectral response with a characteristic peak at ~700 nm.
- We report a novel graphene-Ag0 hybrid plasmonic nanostructures based photodetector exhibiting high responsivity (~28 mA/W) and spectral selectivity (~510 nm) in the visible wavelength.

Tunable Optical properties from Graphene based hybrid nanostructures 06/2012 – 06/2017

- Study the optical properties of graphene oxide by modulating different oxygen function groups.
- Observed tunable absorption and emission from graphene oxide by tailoring its different functional group by controlled IR induced reduction and role of different functional groups have been studied.
- We have observed tunable nonlinear optical properties of both graphene oxide as well as the reduced graphene oxides measured by single beam Z-scan measurement in the femto-second region.
- The results reveal both saturable absorption and two-photon absorption, strongly dependent on the intensity of the pump pulse: saturable absorption occurs at lower pump pulse intensity, whereas two-photon absorption dominates at higher intensities.
- Graphene only absorbs 2.3% of light, but in order to achieve effective modulators and photocells it is necessary to enhance light- matter interactions in a graphene sheet. The combination of graphene with conventional plasmonics based on noble metals would open a way to new hybrid systems with mutually enhanced properties.
- We have investigated novel opto-chemical doping in Ag nanoparticle decorated monolayer CVD graphene by Raman spectroscopy for the 1st time. Here we have used both noble metal nanoparticles and laser power, in a hybrid opto-chemical route, to tune doping level in graphene.
- Our novel method lowers significantly the laser intensity required for optical power dependent doping, and also protects the sample from damage due to local-heating.
- We report the novel thermal quenching of carbon nanodots (CNDs), synthesized by a simple solvothermal method.
- We observed for the first time the observation of positive to negative tuning of thermal quenching behavior, in the temperature range 10 K to 300 K, for annealed CND samples.

## List of Publications (citation=834*, h-index=16, i10-index=20)

### Journals

**2019-20**

[33] R. Amin, R. Maiti, J. Khurgin, and V. Sorger, "Low Dimensional Material based Electro-Optic Phase Modulation Performance Analysis," submitted to Journal of Selected Topics in Quantum Electronics, (2020).

[32] V. Sorger, R. Maiti, "Roadmap for Gain-Bandwidth-Product Enhanced Photodetectors" **OMEX**, 10(9), 2192-2200, (2020).

[31] R. Amin, R. Maiti, Yaliang Gui, Can Suer, Mario Miscuglio, Elham Heidari, J. Khurgin, Ray T Chen, Hamed Dalir, Volker J Sorger, "Heterogeneously Integrated ITO Plasmonic Mach-Zehnder Interferometric Modulator on SOI" submitted to Scientific Reports, (2020).

[30] R Maiti, C Patil, T Xie, JG Azadani, MASR Saadi, R Amin, M Miscuglio, D Van Thourhout, SD Solares, T Low, R Agarwal, S Bank, VJ Sorger, "Strain-Engineered High Responsivity MoTe2 Photodetector for Silicon Photonic Integrated Circuits", **Nature Photonics**, 14(9), 578-584, (2020).

[29] Rubab Amin, Rishi Maiti, Yaliang Gui, Can Suer, Mario Miscuglio, Elham Heidari, Ray T Chen, Hamed Dalir, Volker J Sorger, "Broadband Sub-{\lambda} GHz ITO Plasmonic Mach-Zehnder Modulator on Silicon Photonics," **OPTICA** 7(4), 333-335, (2020).

[28] Z. Ma, K. Kikunage, H. Wang, S. Sun, R. Amin, M. Tahersima, R. Maiti, M. Miscuglio, H. Dalir, V. J. Sorger, "Compact Graphene Plasmonic Slot Photodetector on Silicon-on-insulator with High Responsivity", **ACS Photonics,** 7(4), 932-940 (2020).

**2018-19**

[27] R. Maiti, C. Patil, R. Hemnani, M. Miscuglio, R. Amin, Z. Ma, R. Chaudhary, C. Johnson, L. Bartels, R. Agarwal, V. J. Sorger, "Loss and Coupling Tuning via Heterogeneous Integration of MoS2 Layers in Silicon Photonics," **Optics Materials Express**, (2019)

[26] A. Elikkottil, M. Tahersima, S. Gu, V. J. Sorger, B. Pesala, "A Spectrally-tunable Dielectric Grating based Metasurface for Broadband Planar Light Concentrator" **Nature: Scientific Reports**, (2019)

[25] R. Maiti, R. A. Hemnani, R. Amin, Z. Ma, M.Tahersima, T. A. Empante, H. Dalir, R. Agarwal, L. Bartels, V. J. Sorger, "A semi-empirical integrated microring cavity approach for 2D material optical index identification at 1.55 mm" **Nanophotonics**, (2019).

[24] Rubab Amin, Mario Zhizhen, Rishi Maiti, Mario Miscuglio, Hamed Dalir, Jacob B. Khurgin, Volker J. Sorger, "A Guide for Material and Design Choices for Electro-Optic Modulators and recent 2D-Material Silicon Modulator Demonstrations", arXiv:1812.11096. (2018)

[23] Rishi Maiti, Subhrajit Mukherjee, Tamal Dey, Samit K Ray, "Solution Processed Highly Responsive UV Photodetectors from Carbon Nanodot/Silicon Heterojunctions", Applied Nano materials, (2019).

[22] V. Demontis, M. Rocci, M. Donarelli, R. Maiti, V. Zannier, F. Beltram, L. Sorba, S. Roddaro, F. Rossella, Camilla Baratto, "Conductometric sensing with individual InAs nanowires", Sensor, 2019.

[21] R. Amin, R. Maiti, M. Miscuglio, Z. Maa, V. Sorger, "A Lateral MOS-Capacitor Enabled ITO Mach-Zehnder Modulator for Beam Steering", Journal of light wave Technology" (2019).

**2017-18**

[20] Rubab Amin, Zhizhen Ma, Rishi Maiti, Sikandar Khan, Jacob B. Khurgin, Hamed Dalir, Volker J. Sorger, "Attojoule-Efficient Graphene Optical Modulators", Appl. Optics, 57 (18), D130-D140.

[19] Rohit A Hemnani, Caitlin Carfano, Jason P Tischler, Mohammad H Tahersima, Rishi Maiti, Ludwig Bartels, Ritesh Agarwal, Volker J Sorger, "Towards a 2D Printer: A Deterministic Cross Contamination-free Transfer Method for Atomically Layered Materials", 2D Materials, (2018).

[18] R. Amin, R. Maiti, C. Carfano, Z. Ma, M. H. Tahersima, Y. Lilach, D. Ratnayake, H. Dalir, V.J. Sorger, "0.52 V-mm ITO-based Mach Zehnder Modulator in Silicon Photonics", APL Photonics, 3, 12. (2018).

**2016-17**

[17] A. Ghorai; A. Midya; R. Maiti; S.K. Ray, "Exfoliation of WS2 in Semiconducting Phase using a Group of Lithium Halides: a New Method of Li Intercalation", Dalton Trans., 2016, **DOI:** 10.1039/C6DT02823C.

[16] R. Maiti, S. Haldar, D. Majumdar, A. Singha and S. K. Ray, "Hybrid Opto-Chemical doping in Ag nanoparticle decorated monolayer CVD graphene probed by Raman spectroscopy", Nanotechnology, 28 (2017) 075707.

[15] R. Maiti, T. Sinha, S. Bhattacharya, P. K. Datta, and S. K. Ray, "A Facile One Pot Synthesis of Highly Stable Graphene-Ag0 Hybrid Nanostructures with Enhanced Optical Properties", JPC C, (2017).

[14] Federica Rigoni, Rishi Maiti, Camilla Baratto, Maurizio Donarelli, Jennifer MacLeod, Bahrati Gupta, Mei Lyu, Andrea Ponzoni, Giorgio Sberveglieri, Nunzio Motta, Guido Faglia "Transfer of CVD-grown graphene for room temperature gas sensors", Nanotechnology (2017).

**2015-16**

[13] **R. Maiti**, Tridib K. Sinha, Subhrajit Mukherjee, Basudam Adhikari, Samit K. Ray, "Metal-Arene Type Silver Nanoparticles Embedded Few-Layer Graphene Sheets: A Two Dimensional Plasmonic Nanostructures for Enhanced and Selective Visible Photodetection", plasmonics (2015).

[12] P. Das, **R. Maiti**, P. Barman, S. K. Ray & S. B. N. Bhaktha, "Mono- to few-layered graphene oxide embedded randomness assisted microcavity amplified spontaneous emission source", Nanotechnology 27 (5), 055201 (2015).

[11] A. Midya, A. Ghorai, S. Mukherjee, **R. Maiti**, and S. K. Ray, "Hydrothermal Growth of Few Layer 2H-MoS2 for Heterojunction Photodetector and Visible Light Induced Photocatalytic Applications", JMC A (2016).

[10] **R. Maiti**, Subhrajit Mukherjee, S. Haldar, D. Bhowmick and Samit K. Ray, "Novel thermal quenching characteristics of luminescent carbon nanodots via tailoring the surface chemical groups", Carbon (2016).

[9] R. K. Chowdhary, **R. Maiti**, A. Ghorai, A. Midya and Samit K. Ray, "Novel silicon compatible hetero-junction using Li-ion intercalated p-WS2 layers exhibiting broadband and superior responsivity", Nanoscale (2016).

[8] S. Mukherjee, **R. Maiti**, A. Katiyar, S. Das and Samit K. Ray "Novel Colloidal MoS2 Quantum dot heterojunction on Si Platform for Multifunctional Optoelectronic Devices, Scientific Reports (2016).

[7] T. K. Sinha, S. Ghosh, **R. Maiti**, S. Jana, D. Mondal, S. K. Ray "Graphene-Silver Induced Self-polarized PVDF Based Flexible Plasmonic Nanogenerator towards the Realization for New Class of Self Powered Optical Sensor", ACS applied materials and Interfaces (2016).

[6] S. Bhattachraya, **R. Maiti**, S. Saha, A.C.Das, S. Mondal, S. K. Ray, S. B. N Bhaktha and P. K Datta, "Efficient control of ultrafast optical nonlinearity of graphene oxide by infrared reduction", JAP (2016).

**2014-15**

[5] **R. Maiti,** A. Midya, and C. Narayana, and S.K. Ray, "Tunable Optical Properties from Graphene Oxide by tailoring Oxygen Functionalities using Infrared Irradiation", Nanotechnology 25, 495704 (2014).

[4] P. Das, **R. Maiti,** S. K. Ray, and Shivkaran B. N. Bhaktha, "Increased photon density of states at defect-mode frequencies led enhancement of tunability of spontaneous emission from Eu2+, 3+ doped $SiO_2$ / $SnO_2$ one-dimensional photonic crystals", Mater. Res. Express 2 036201, (2015).

[3] Shruti Mukundan, Lokesh Mohan, Greeshma Chandan, Basanta Roul, S. Krupanidhi, Satish Shinde, Karuna Nanda, **R. Maiti**, and Samit K. Ray, "High indium non-polar InGaN clusters with infrared sensitivity grown by PAMBE", AIP Advance, 5 (3), 037112, (2015).

[2] S. Mukherjee, **R. Maiti**, A. Midya, S. Das, and S.k. Ray, "Tunable Direct Bandgap Optical Transitions in MoS2 Nanocrystals for Photonic devices", ACS Photonics, 2 (6), pp 760–768 (2015).

**2013-14**

[1] **R. Maiti,** S. Manna, A. Midya, and S. K. Ray, "Broadband photoresponse and rectification of novel graphene oxide/n-Si heterojunctions", Optics Express, 21, 22, 26034-43 (2013).

## List of Patent

[1] Strain-Engineered Integrated MoTe2 Photodetectors for High Responsivity (2020), **U.S. Provisional Application No. 62/938,116.**

## Conference & Symposium

**2012-13**

[1] **R. Maiti**, S. Manna, A. Midya, A. Katiyar, and S. K. Ray, "Enhanced Photoresponse in Graphene Oxide Based MOS Photodetector", ISJPS-2013, Indian Institute of Technology Kharagpur, India, February 25-27 (2013).

**2013-14**

[2] **R. Maiti**, S. Manna, A. Midya, and S. K. Ray, "Electrical & Optical Characterization of a Novel Graphene Oxide/n-Si heterojunctions ", IUMRS-ICA2013, Indian Institute of Science, Bangalore, India, December 16-20 (2013).

[3] Attended a **Winter School on Frontiers in Materials Science** at JNCASR, Bangalore, India, December 2-6 (2013).

[4] DAE-BRNS National Symposium on **Pulsed Laser Deposition of Thin Films and Nanostructured Materials,** Nov. 14-16 (2013), Indian Institute of Technology Kharagpur, India.

[5] Indo-UK Seminar "**From Graphene Analogues to Topological Insulators**" **(GATI-2014),** January 27-29 (2014) IACS, Kolkata, India.

**2014-15**

[6] Presented a talk on **"Photonic Crystals: Structures & Applications"** in **13th Indo-European Winter Academy**, Kanpur, India, December 3-9, 2014.

[7] **R. Maiti**, A. Midya, and S. K. Ray, "Tunable Optical Emission Characteristics of Graphene Oxide for Optoelectronic Device Applications", **Photonics-2014,** Indian Institute of Technology Kharagpur, India, Dec 13-16 (2014).

[8] Pratyusha Das, **Rishi Maiti**, Prahalad K. Barman, Samit K. Ray, and Shivakiran Bhaktha B.N Spectral Management of Eu2+,3+ Emission in Sol-Gel Fabricated One-dimensional Photonic Crystals, **Photonics-2014,** Indian Institute of Technology Kharagpur, India, Dec 13-16 (2014).

**2015-2016**

[9] **R. Maiti**, S. Mukherjee, S. Haldar, T. K. Sinha and S. K. Ray, Few-Layer Graphene Sheets Encapsulated Silver Nanoparticles : A Hybrid Platform for Enhanced Light Matter Interaction, AIP, IIT Kharagur, India, 14-16th Nov, 2015

[10] Sandipan Haldar, **Rishi Maiti**, Achintya Singha, Samit K ray, Raman spectroscopy of silver nanoparticle decorated CVD graphene AIP, IIT Kharagur, India, 14-16th Nov, 2015

[11] D. Bhowmik, **Rishi Maiti** and S. K. Ray UV Photodetector Based on Carbon nano dots/n-Si heterojunction, AIP, IIT Kharagur, India, 14-16th Nov, 2015

[12] Pratyusha Das, **Rishi Maiti**, Prahalad K Barman, Samit K Ray and S N B Bhaktha Graphene Oxide Incorporated Low-threshold Micro-cavity Tunable Laser, AIP, IIT Kharagur, India, 14-16th Nov, 2015.

[13] S. Bhattachraya, **Rishi Maiti**, A.C.Das, S. Saha, S. Mondal, S. K. Ray, S. B. N Bhaktha and P. K Datta Non-linear optical property of IR induced partially reduced graphene oxide in femtosecond regime, **NLS, RRCAT INDORE, INDIA 2015.**

[14] A C Das, R Maiti, M Jewariya, S Bhattacharya, S Mondal, S N B Bhaktha, S K Roy and P K Datta Optical and Electrical Properties of Reduced Graphene Oxide Thin Film in Terahertz Frequency Range **NLS, RRCAT INDORE, INDIA 2015**

[15] **R. Maiti**, S. Bhattacharya, P. K. Datta, and S. K. Ray, Tunable Optical Properties of Graphene Oxide: Role of Individual Oxygen Functional groups, **MRS FALL Meeting & Exhibition, 29th Nov to 4th Dec, 2015.**

[16] **R. Maiti**, S. Haldar, S. Mukherjee, T. K. Sinha and S. K. Ray, Silver Nanoparticles Embedded Few-Layer Graphene Sheets: A Hybrid Platform for Enhanced Light Matter Interaction, **IWPSD, IISC Bangalore, India, Dec 7-11, 2015.**

[17] R. K. Chowdhury, **R. Maiti**, A. Ghorai, A. Midya and S. K. Ray, Novel Optoelectronic performance of chemically exfoliated few-layers p-WS2 /n-Si vertical hetero-junctions, **IWPSD, IISC Bangalore, India, Dec 7-11, 2015.**

[18] **R. Maiti**, S. Mukherjee, T. K. Sinha and S. K. Ray, "Few-Layer Graphene Sheets Encapsulated Silver Nanoparticles: A Hybrid Platform for Enhanced Light Matter Interaction", **MRS Spring Meeting & Exhibition, 28th March to 1st Apr, 2016.**

[19] S. Bhattachraya, **R. Maiti**, S. Saha, A.C. Das, S. Mondal, S. K. Ray, S. B. N Bhaktha and P. K Datta, Infrared reduction, an efficient method to control the non-linear optical property of graphene oxide in femtosecond regime, **SPIE Photonics Europe, Brussels, Belgium, Apr 3-7, 2016.**

[20] Pratyusha Das, **Rishi Maiti**, Camilla Baratto, Giorgio Sberveglieri, Bhaktha B N Shivakiran and Samit K Ray, "Few-layered graphene oxide embedded 1DPhC microcavity for amplified spontaneous emission source", **Graphene 2016, Genova, Italy, Apr 18-23, 2016**.

[21] R. K. Chowdhury, **R. Maiti**, A. Ghorai, A. Midya and S. K. Ray, "Optical characteristics of novel vertical heterostructure of silicon compatible Li-ion intercalated p-WS2 layers", **GM-2016, Paestum, Italy, May 23-27, 2016.**

[22] F. Rigoni, R. Maiti, C. Baratto, M. Donarelli, J. MacLeod, B. Gupta, M. Lyu, A. Ponzoni, G. Sberveglieri, N. Motta and G. Faglia "Transfer of CVD-grown graphene for room temperature gas sensors", **GM-2016, Paestum, Italy, May 23-27, 2016.**

**2016-2017**

[23] Pratyusha Das, **Rishi Maiti**, Subhrajit Mukherjee, S.K. Ray, Shivakiran Bhaktha B. N., "2D Semiconductor Embedded Microcavity Amplified Spontaneous Emission Source", ICTON-2016, Italy.

[24] Pratyusha Das, **Rishi Maiti**, Subhrajit Mukherjee, Arup Ghorai, Anupam Midya, S.K. Ray and Shivakiran Bhaktha B. N., "Amplified Spontaneous Emission from Graphene Oxide Embedded Nanocrystalline One Dimensional Microcavity", CLEO 2016, USA.

[25] F. Rigoni1,2, C. Baratto2,1, **R. Maiti1**, M. Donarelli1,2, N. Cattabiani1,2, E. Comini1,2, M. Ferroni1,2, D. Zappa1,2, A. Ponzoni2, G. Sberveglieri1,2 and G. Faglia1,2, "ZnO/graphene hybrid system: optical, electrical and gas sensing properties", TCM 2016, Crete, Greece.

[26] R. Maiti, F. Rigoni, C. Baratto, S. K. Ray and G. Sberveglieri, "Graphene plasmon enhanced optical properties in ZnO micro-structures", Photonics 2016, India.

**2017-2018**

[27] Tridib Sinha, Rishi Maiti, Basudam Adhikari, K. Samit Ray, "Volatile Aroma Sensing Performance of High Quality Pristine Graphene, obtained via a facile Exfoliation technique", Materials Today, 5 (3), 9888-9891, 2018.

[28] Rohit A. Hemnani, Caitlin Carfano, Rishi Maiti, Mohammad H. Tahersima, and Volker J. Sorger. "Towards a 2D Printer." META (2018), SPIE (2018).

**2018-2019**

[29] Minutes-fast Heterostructure Prototyping via 2D Material Printing: Electrical 2D-LED and Tunnel Junctions R Hemnani, R Maiti, V Sorger Frontiers in Optics, FW7A. 1, 2018.

[30] Graphene-based Slot Waveguide Photodetectors for Optical Communications, K Kikunaga, Z Ma, R Maiti, VJ Sorger, Laser Science, JW3A. 97, 2018.

[31] ITO-based Mach Zehnder Modulator R Amin, R Maiti, C Carfano, VJ Sorger Frontiers in Optics, JTu3A. 73, 2018.

[32] Purcell Enhancement in 1-D ITO-slot Photonic Crystal Nanobeam Cavity R Amin, MH Tahersima, Z Ma, C Suer, K Liu, R Maiti, VJ Sorger Frontiers in Optics, FW5E. 2, 2018.

[33] Integration of TMDCs Layer on a Silicon Micro-ring Resonator for Photonic Applications R Maiti, R Hemnani, R Amin, VJ Sorger Laser Science, JW4A. 96, 2018.

**2019-2020**

[34] "An ITO-based Mach-Zehnder Modulator with Lateral MOS-Capacitor on SOI Platform", Rubab Amin, Rishi Maiti, Zhizhen Ma, Mario Miscuglio, Hamed Dalir, Volker Sorger, FIO+LS, 2019.

[35] "Silicon Resonant Cavity Enhanced $MoTe_2$ Schottky Photodetectorat 1.55 μm", Rishi Maiti, chandraman patil, Xie Ti, Volker Sorger, FIO+LS, (2019).

[36] "Ultrasensitive Phototransistor Based on Multi-layered $MoTe_2$", Ti Xie, Rishi Maiti, Volker Sorger, FIO+LS (2019).

[37] "$MoTe_2$ Based Electro-optic Modulator on Mach-Zehnder Interferometer", Nayeem Ansari, Rubab Amin, Rishi Maiti; Volker Sorger, FIO+LS (2019).

[38] Silicon Nitride Photonic Platform for 2D Materials Integration, Chandraman Patil, Rishi Maiti, Volker Sorger, FIO+LS (2019).
[39] "Graphene/$Al_2O_3$/Graphene Heterojunction for Light Emitting Tunneling Diode" Haoyan Kang, Rishi Maiti, Rohit Hemnani, Mario Miscuglio, Volker Sorger, FIO+LS (2019).
[40] "Towards Exciton-near Plasmon Slot-waveguide MoTe2 Photodetector on SOI", Hao Wang, Zhizhen Ma, Rishi Maiti, Mario Miscuglio, Volker Sorger, FIO+LS (2019).

## Talk & Presentations

| | | |
|---|---|---|
| MRS 2020 | Boston | 2020 |
| FIO+LS | Washington DC | 2020 |
| CLEO-2020 | San Hose | 2020 |
| Photonic West 2020 | San Francisco | 2020 |
| IWPSD (Invited) | Kolkata | 2019 |
| FIO+LS | Washington DC | 2019 |
| IEEE RAPID | Florida | 2019 |
| OSA APC 2019 | San Francisco | 2019 |
| OPTICS & Laser (Invited) | San Francisco | 2019 |
| Graphene & Beyond | Pennsylvania | 2019 |
| MRS Spring-2019 | Phoenix, Arizona | 2019 |
| CLEO-2019 | San Hose | 2019 |
| SPIE Photonics WEST | San Francisco | 2019 |
| FIO+LS 2018 | Washington DC | 2018 |
| SPIE Optics & Photonics | San Diego, California | 2018 |
| GM-2016 | Paestum, Italy | 05/2016 |
| Graphene 2016 | Genova, Italy | 04/2016 |
| MRS Spring 2016 | Phoenix, Arizona | 04/2016 |
| MRS Fall Meeting & Exhibition 2016 | Boston, MA | 11/2015 |
| Photonics 2014 | IIT Kharagpur, India | 12/2014 |
| 13th Indo-European Winter Academy | IIT Kanpur, India | 11/2014 |
| GATI-2014 | IACS Kolkata, India | 01/2014 |
| IUMRS-ICA 2013 | IISC Bangalore | 12/2013 |
| Frontiers in Materials Science | JNCASR Bangalore | 12/2013 |

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