Curriculum Vitae

PRASANA KUMAR SAHOO (Ph.D.)

Assistant Professor, Material Science Centre,
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Dr. Sahoo's research focuses on exploring and understanding exotic two-dimensional (2D) quantum materials and their heterostructures, which have a fundamental and wide range of technological implications in future optoelectronics such as LEDs, photovoltaics, and quantum technologies. His work has covered various nanomaterials, including 2D materials and heterostructures (Graphene and beyond), group III-V based semiconductor nanowires, and sensors. He exploits a combination of materials synthesis, heterostructuring, and device fabrication for physicochemical properties assessment. He is a pioneer in the invention of the one-pot and in-situ growth of multi-junction 2D lateral heterostructures and superlattices via the water-assisted CVD technique. For the last several years, he has focused on lateral and vertical heterostructures and tuning physical properties via doping and alloying to access exotic properties of 2D materials.

I. EDUCATION AND TRAINING

2013 **PhD in Physics**, Homi Bhabha National Institute (HBNI), Indira Gandhi Center for Atomic Research, Kalpakkam, India. (**HBNI Outstanding Thesis, Gold Medal**)

2007 **Master of Science** in **Physics**, Sambalpur University, India. (**University Gold Medal**)

2005 **Undergraduate Degree** in **Physics**, Utkal University, India. (**Honors & Distinction**)

II. PROFESSIONAL EXPERIENCE

July 2019 Conti. Assistant Professor, Material Science Centre, IIT Kharagpur, India

Research Group: Quantum Materials and Device Research Laboratory (QMDrL)

- Two dimensional (2D) quantum materials, van der Waals heterostructures, and Excitons
- Fabrication of multi-junction lateral and vertical heterostructure of 2D quantum materials, nanoscale device physics, electronic and optical characterizations
- Quantum phase engineering, optoelectronic device development, and sensors
- To create a synergetic platform by integrating different areas of science at the nanoscale and to bridge the gap between fundamental science and technology development

12/2018 to 07/2019 Post-Doctoral Research Associate

University of Cambridge, Cambridge Graphene Centre, Cambridge, UK

Research Project: Optoelectronic devices based on Graphene, related materials, and heterostructures.

- Integration of transition metal dichalcogenides (TMD) heterostructures with Graphene for direct optoelectronic device fabrication: Photovoltaic, LED, and photosensor application

11/2018 to 12/2018 **Visiting Scientist,** Institute of Physics, Bhubaneswar, India

02/2016 to 09/2018 **Post-Doctoral Research Associate**

The University of South Florida, Department of Applied Physics, Tampa, FL, 33620-7100, USA.

Research Project: Two-Dimensional Heterostructures Based on 2D Layered Materials: Transition Metal Dichalcogenide (TMD).

- Scalable growth of 2D layered materials, lateral and vertical multi-junction heterostructures of TMDs ($MoSe_2$-WSe_2, MoS_2-WS_2), and superlattices,
- Tunable ternary-alloy heterostructures [$MoS_{2(1-n)}Se_{2n}$ – $WS_{2(1-n)}Se_{2n}$; n=0-1]
- In-situ photo-conversion TMDs for in-plane heterostructure fabrication
- Nano-spectroscopy and exciton-polaritons in 2D heterostructures/superlattices

01/2013- 01/2016 **Post-Doctoral Fellow**

The State University of Campinas, Department of Applied Physics, Sao Paulo, Brazil; **Research Grant: FAPESP-** Process Number: 2012/13896-0.

Research Project: "Development of Semiconductor Nanowire-based Nanosensors; and applications to adhesion studies of *Xylella fastidiosa* bacteria".

- Controlling the Growth and Fabrication of addressable InP nanowire device arrays
- Nanowire arrays based sub-cellular force sensor (ex-vivo): *Quantitative evaluation of cell forces down to nN level using nanowire arrays and fluorescence microscope*

08/2007-10/2012 **Ph.D. Research**

Homi Bhabha National Institute, Indira Gandhi Center for Atomic Research, Department of Atomic Energy, Kalpakkam, TN, India; Registration Number: PHYS02200704020

Dissertation: Quasi One-Dimensional GaN Nanostructures: Growth Kinetics, Physical Properties, and Applications. **Research Project:** Controlled growth of GaN nanostructures by CVD technique; Structural and optoelectronic characterization by HRTEM, FESEM, Raman scattering, and Photoluminescence techniques; demonstrated ultra-sensitive DNA biosensor and Hydrogen sensing properties nanomaterials; explored nanoparticle and Bacteria cell interaction dynamics.

III. TECHNICAL EXPERTISE

- **Growth, Structural and Optical Characterization of 1D and 2D Nanomaterials**
  - 2D layered materials, lateral and vertical multi-junction heterostructures of TMDs ($MoSe_2$-WSe_2, MoS_2-WS_2, MoS_2-WSe_2, $MoSe_2$-WS_2), ternary TMD alloys heterostructure
  - Scalable growth of TMDs monolayer and bilayer 2D films (10x10 mm)
  - Direct growth of Graphene-TMDs heterojunctions
  - Graphene (1L, 2L, and multilayer 2D films), and Boron Nitride
  - 1D Nanostructures: GaN, InP nanowires arrays
- **Material Synthesis Techniques**
  - Chemical and Physical Vapor Deposition, PLD, Chemical Beam Epitaxy
- **Nano and Microfabrication Techniques**
  - Electron Beam Lithography (Raith eLINE)
  - Laser lithography and mask fabrication (Heidelberg µPG 101 system)
  - Photolithography
  - Focused Ion beam for imaging and pattering
- **Devices Development**

- 2D Optoelectronic Devices (photosensor, photodetector, solar cells, etc.)
- Van der Waals heterostructures using TMDs, and Graphene
- Single Nanowire Arrays Device: chemical and biomolecule detection
- PDMS-based Microfluidic Devices
- Nanowire/Nanotube-based Gas Sensor

- **Material Characterization Techniques**
  - Micro-Raman & Photoluminescence Spectroscopy
  - Atomic Force Microscopy and Kelvin Probe Force Microscopy
  - 4D Confocal Fluorescence Microscopy
  - High-Resolution Transmission Electron Microscopy (HRTEM)
  - Field Emission Scanning Electron Microscopy (FESEM)
  - X-ray diffraction
- Bio-Chemical surface functionalization, Bacterial cultures, and fluorescence imaging

IV. Professional Training/Workshop Attended

2013-2014 Trained as a user in clean-room nanofabrication multi-user facilities, State University of Campinas, SP, Brazil *(Electron-beam lithography, Photolithography, Laser-lithography and Photomask fabrication)*
2013 III Workshop on Microfluidics, National Center for Research in Energy and Materials, Brazil.
2010 Workshop on Cancer Nanotechnology, Indian Institute of Technology, Mumbai, India.
2009 Workshop on Nanoscale Device fabrication, INUP, Indian Institute of Technology, Mumbai, India.
2009 Indo- US Workshop in "Visible and Ultra violate sources for Solid State Lightening and Water Purification", Anna University, Chennai, India.
2008 Quantum condensed matter system, Institute of Mathematical Science, Chennai, India.
2006 Summer Trainee: **PIXE** characterization of Gallstone, Institute of Physics, India.

V. ACADEMIC CREDENTIALS

2018 News Highlights: Nature News, Nature Japan, Physics Organization, and NHMFL News
08/2015 **Ten Years of Excellence** (2005-2015)- **Outstanding Ph.D. Thesis Award**, Homi Bhabha National Institute – a grant-in-aid institute of the Department of Atomic Energy (**DAE**), India.
01/2013 The State of São Paulo Research Foundation Post-Doctoral fellowship, Brazil.
02/2012 **Best Paper Award-** First position as Young Researcher Category, International Conference in Nanoscience & Technology (**ICONSAT**) 2012, Hyderabad, India.
2011 Awarded travel grant from Department of Science and Technology (DST), India, to attend Material Research Society (MRS) Fall Meeting, USA.
2007/2008 University **Gold Medal** for Securing First Position**,** Sambalpur University, India
08/2007 Honored as **Junior Research Fellow,** Department of Atomic Energy (DAE), India.
03/2007 Honored for Research Fellowship grant through- Graduate Aptitude Test for Engineering (**GATE**) & Joint Entrance Screening Test (**JEST**) national scholarship scheme, India.
05-06/2006 Summer Research Internship, DAE, Institute of Physics, Bhubaneswar, India.

VI. Editorial Board Member

Material Science Research India (ISSN 0973-3469)

VII. Membership

Material Research Society of India (MRSI, Lifetime member, LMB1510)

Electron Microscopy Society of India (EMSI, Life Member LM-1644)

VIII. Project/Funding

1. Project Title: Emergent Phases in 2D Quantum Materials and Heterostructures,

   (DST Thematic Proposal on Quantum Materials)
   Role: Principal Investigator and Coordinator (2021 to 2025)
2. Project Title: Scalable Growth of Electronic Grade Two Dimensional Semiconductors and Heterostructures via Water-assisted one-pot CVD technique.
   (DST Advanced Manufacturing Technology (AMT) proposal)
   Role: Principal Investigator (2022-2024)
3. Project Title: Control growth of two-dimensional lateral heterostructures and characterizations (Institute Scheme for Innovative Research and Development, ISIRD, SRIC, IIT Kharagpur) Role: Principal Investigator (2019 to 2022)

IX. Supervising/Mentoring

1. Ph.D. Scholar: 5 (ongoing)
2. M. Tech Student: 5 Completed, and 3 (on-going)
3. Doctoral Committee Member 12

X. Teaching Courses

1. Materials Science (UG Course / BTECH; Spring and Autumn Semester)
2. Laboratory (for MTech/PhD)
3. Seminar (M-Tech)
4. DIY Project (UG Course / BTECH)

XI. Referee for Journals (selected):

Advance Materials, Nature Communication, Advanced Functional Materials, ACS Nano, Applied Physics Letters, 2D materials, Nanoscale, Nanoscale Horizon, J. Applied Physics, Rev. of Scientific Instruments, Crystal Growth & Design, IEEE Sensors, Biosensor and Bioelectronics, Chemical Communication, J. Material Chemistry C, & JMC B, J. Physical Chemistry C, CryEngComm, PCCP, ACS Applied Nano Materials, J. Raman Spectroscopy, RSC Advance

XII. Book Chapters

1. B. Kundu, P. Mohanty, **Prasana K. Sahoo,*** *Synthesis of 2D Heterostructures, Chapters for 2D Materials for Electronics, sensors, and devices,* **2022** *Elsevier,* ISBN: 9780128215050
2. S. Dhara, **Prasana Sahoo**, A. K. Tyagi, B. Raj, Surface Optical Modes in Semiconductor Nanowires; *Nanowires-Implementations and Applications,* **2011***, In tech- Open Access Book, ISBN 978-953-307-318-7.*
3. **Prasana Sahoo**, R. Janissen, A. Das, D. Inbakandan, P. S. Murthy; Nanopaticulates and Nanocomposites as Antibiofilm Agents: Evolving Perspectives, **2018,** *Biofilm Control: Biomedical & Industrial Environments*. ISBN 978-81-8487-623-9.

XIII. International Journal Publications (*Corresponding Author)

1. F. A. Nugera, **Prasana K.Sahoo**, Y. Xin, S. Ambardar, D. Voronine, U. J. Kim, Y. Han, H. Son, H. R. Gutiérrez, *Bandgap Engineering in 2D Lateral Heterostructures of Transition Metal Dichalcogenides via Controlled Alloying,* **Small 2106600 (2022) 1-11**.
2. S. K. Chakraborty, B. Kundu, B. Nayak, S. P. Dash, **Prasana K. Sahoo**, Challenges and opportunities in 2D heterostructures for electronic and optoelectronic devices, **iScience 25 (2022) 103942** *(Invited)*.
3. S. Ambardara, R. Kamh, Z. H. Withers, **Prasana K. Sahoo** and D. Voronine, Coupling nanobubbles in 2D lateral heterostructures, **Nanoscale, 14 (2022) 8050-8059.**
4. A. Albagami, S. Ambardar, H. Hrim, **Prasana K Sahoo**, Y. Emirov, H. R. Gutiérrez, D. V. Voronine, *Tip-Enhanced Photoluminescence of Freestanding Lateral Heterobubbles,* **ACS Applied Materials & Interfaces 14 (2022) 11006.**
5. R. K. Behera, L. Mishra, A. Panigrahi, **Prasana K. Sahoo**, M. K. Sarangi, *Tunable Conductance of MoS2 and WS2 Quantum Dots by Electron Transfer with Redox-Active Quinone,* **ACS Appl. Mater. Interfaces 14 (2022) 5750–5761**.
6. F. Sousa, L. Fonseca, A. Cadore, **Prasana K. Sahoo**, L. Malard, *Revealing Atomically Sharp Interfaces of Two-Dimensional Lateral Heterostructures by Second Harmonic Generation*, **2D Materials 8 (2021) 035051**
7. B. Kundu, P. Mohanty, P. Kumar, B. Nayak, B. Mahato, P. Ranjan, S. K. Chakraborty, S. Sahoo & **Prasana K. Sahoo**,* *Synthesis of lateral heterostructure of 2D materials for optoelectronic devices: challenges and opportunities*, **Emergent Materials 4 (2021) 923–949** *(Invited)*
8. S. Berweger, H. Zhang, **Prasana K. Sahoo,*** B. M. Kupp, J.y L. Blackburn, E. M. Miller, T. M. Wallis, D. Voronine, P. Kabos, S. Nanayakkara, *Spatially Resolved Persistent Photoconductivity in MoS_2–WS_2 Lateral Heterostructures*; **ACS Nano 14 (2020) 14080–14090**.
9. M. Trushin, S. Sarkar, S. Mathew, S. Goswami, **Prasana Sahoo**, Y. Wang, J. Yang, W. Li, J. L. MacManus-Driscoll, M. Chhowalla, S. Adam, T. Venkatesan; *Evidence of Rotational Fröhlich Coupling in Polaronic Trions*; **Phys. Rev. Lett. 125 (2020) 086803.**
10. **Prasana K. Sahoo,*** S. Memaran, F. A. Nugera, Y. Xin, T. D. Márquez, Z. Lu, W. Zheng, N. D. Zhigadlo, D. Smirnov, L. Balicas, H. R. Gutiérrez; *Bilayer Lateral Heterostructures of Transition Metal Dichalcogenides and their optoelectronic response.* **ACS Nano 13** (**2019)**, **12372-12384.**
11. **Prasana K. Sahoo**,* S. Memaran, Yan Xin, Luis Balicas, H. R. Gutiérrez, *One-pot growth of two- dimensional lateral heterostructures via sequential edge-epitaxy;*

    Nature 553 (2018) 63–67.

    News Highlights

    - **Nature News & Views, 3 Jan 2018, V 553, 32-34;** Nanoscale interfaces made

easily.

- **Nature Japan and Phy.Org:** Creating 2-D dichalcogenide structures using chemical vapor deposition**, Jan 4, 2018.**
- **News Highlights;** National High Magnetic Field Laboratory, FL, USA: A unique way to bond together single-layer semiconductors opens a door to new nanotechnologies.

12. C. E. Stevens, J. Paul, T. Cox, **Prasana K. Sahoo**, H. Gutierrez, V. Turkowski, D. Semenov, S. McGill, M. Kapetanakis, I. Perakis, D. Hilton, D. Karaiskaj, *Biexcitons in monolayer transition metal dichalcogenides tuned by magnetic fields: toward a pure biexciton liquid;*

    Nature Communication 9 (2018) 3720.

    NEWS Highlights: When bright and dark bind together *by Cedric Robert.*

    Nature Nanotechnology *News & Views 28 Sept 2018*

13. M. Monteiro, J. Montelongo, **Prasana K.Sahoo**, R. Montelongo, D. Oliveira, M. Piazzeta, J. Sandoval, A. Souza, A. Gobbi, M. Cotta, *Functionalized microchannels as xylem-mimicking environment: Quantifying X. fastidiosa cell adhesion,* **Biophysical Journal 120 (2021) 1443.**

14. T. Afanesh, **Prasana K. Sahoo,** I. A. P. Nobrega, Y. Xin, H. R. Gutierrez, *Laser-induced chemical modification of monolayer Transition Metal Dichalcogenides;* **Advanced Functional Materials, 28 (2018) 1802949.**

15. **Prasana K. Sahoo**, H. Zong, J. Liu, W. Xue, X. Lai, H. R. Gutiérrez, D. V. Voronine, *Probing nano-heterogeneity and aging effects in lateral 2D heterostructures using tip-enhanced photoluminescence,* **Optical Materials Express, 9 (2019) 1620-1631**.

16. W. Xue, **Prasana K. Sahoo**, J. Liu, H. Zong, X. Lai, S. Ambardar, D. V. Voronine, *Nano-optical imaging of monolayer $MoSe_2$-WSe_2 lateral heterostructure with subwavelength domains,* **J. Vac. Sci. Technol. A 36 (2018) 05G502.**

17. R. Janissen[#], **Prasana K. Sahoo**,[#] C. A. Santos, A. M. da Silva, A. A. G. Zuben, A. D. T. Costa, P. Celedon, N. I. T. Zanchin, D. B. Almeida, D. S. Oliveira, C. L. Cesar, A. P. de Souza, M. A. Cotta*, InP Nanowire FET Biosensor with tailored Biofunctionalization: Ultrasensitive and Highly Selective Disease Biomarker Detection;* **Nano Letters 17 (2017) 5938–5949.** *[#]Equal Contribution*

18. **Prasana K. Sahoo**, R. Janissen, M. P. Monteiro, A. Cavalli, D. M. Murillo, M. V. Merfa, C. L. Cesar, H. F. Carvalho, A. A. de Souza, E. P. A. M. Bakkers, M. A. Cotta; *Nanowire Arrays as Cell Force Sensors to Investigate Adhesin-Enhanced Holdfast of Single Cell Bacteria and Biofilm Stability;* **Nano Letters 16 (2016) 4656-4664.**

19. A. M. da Silva, **Prasana K. Sahoo**, A. Cavalli, A. A.de Souza, E. P.A.M. Bakkers, C. L. Cesar, R. Janissen, M. A. Cotta, *Nanowire Arrays as Force Sensors with Super-Resolved Localization Position Detection: Application to Optical Measurement of Bacterial Adhesion Forces***; Small Methods 2 (2018) 1700411.**

20. A. K. Prasad, **Prasana K. Sahoo**, S. Dhara, S. Dash, A. K. Tyagi, *Differences in hydrogen absorption over Pd and Pt functionalized CVD-grown GaN nanowires*; **Materials Chemistry and Physics 211 (2018) 355e360.**

21. M. Moeller, D. S. Oliveira, **Prasana K. Sahoo**, M. A. Cotta, F. Iikawa, P. Motisuke, A. M. Sanchez, M. M. de Lima Jr., A. G. Cristobal, A. Cantarero; *Fermi Energy Dependence of the Optical Emission in core/shell InAs Nanowire Homostructures;* **Nanotechnology 28 (2017) 295702.**

22. J. Pan, **Prasana K. Sahoo**, A. Dalzini, Z. Hayati, C. M. Aryal, P. Teng, J. Cai, H. R. Gutierrez, L. Song; *Membrane Disruption Mechanism of a Prion Peptide (106-126) Investigated by Atomic Force Microscopy, Raman and Electron Paramagnetic Resonance Spectroscopy;* **J. Physical Chemistry B 121 (2017) 5058.**

23. M. P. Monteiroa, J. H. Clericia, **Prasana K. Sahoo**, C. L. Cesar, A. A. de Souza, M. A. Cotta, *Stiffness signatures along early stages of Xylella fastidiosa biofilm formation;* **Colloids & Surfaces B: Biointerfaces 159 (2017) 174.**

24. J. H. Montelongo, V. F. Nascimento, D. Murillo, T. B. Taketa, **Prasana K. Sahoo**, A. A. de Souza, M. M. Beppu, M. A. Cotta, *Nanofilms of hyaluronan/chitosan assembled layer-by-layer: an antibacterial surface for Xylella fastidiosa*, **Carbohydrate Polymers 136 (2016) 1.**

25. R. Janissen, D. M. Murillo, B. Niza, **Prasana K. Sahoo**, M.M. Nobrega, C.L.Cesar, M. L. A. Temperini, H. F. Carvalho, A.A. de Souza, M.A. Cotta; *Spatiotemporal distribution of exopolysaccharides and phenotypic changes mediate Xylella fastidiosa adhesion and biofilm formation;* **Scientific Reports 5 (2015) 9856**.

26. A. Patsha, **Prasana Sahoo**, S. Amirthapandian, A. K. Prasad, A. Das, A. K. Tyagi, M. A. Cotta, S. Dhara, *Localized Charge Transfer Process & Surface Band-Bending in methane sensing by GaN Nanowires;* **J. Physical Chemistry C 119 (2015) 21251.**

27. **Prasana Sahoo,*** S. Dhara, S. Amirthapandian, M. Kamruddin, *Evolution of GaN Nanowire morphology during Catalyst-Induced growth Process;* **J. Material Chemistry C** 1 (**2013) 7237.**

28. **Prasana Sahoo**,***** S. Sumathi, S. Dhara, G. Saini, S. Rangarajan, S. Dash, A.K. Tyagi, *Direct label Free Ultrasensitive Impedimetric DNA Biosensor using Dendrimer Functionalized GaN Nanowires;* **Biosensor & Bioelectronics 44 (2013) 164.**

29. **Prasana Sahoo**,***** P. S. Murthy, S. Dhara, V. P. Venugopala, A. Das, A. K. Tyagi, *Probing the Cellular Damage in Bacteria Induced by GaN Nanoparticles using Confocal Laser Raman spectroscopy;* **J. Nanoparticle Research 15 (2013) 1841.**

30. **Prasana Sahoo***,* S. Dhara, S. Dash, S. Amirthapandian, A. K. Prasad, A. K. Tyagi, *Room temperature H_2 sensing using Pt- functionalized GaN nanotubes;* **Int. Journal of Hydrogen Energy 38 (2013) 3513**.

31. **Prasana Sahoo**,***** S. Dhara, S. Amirthapandian, M. Kamruddin, S. Dash, A. K. Tyagi, *Role of surface polarity in self-catalyzed nucleation and evolution of GaN nanostructures;*

    Crystal Growth & Design 12 (2012) 2375.

32. **Prasana Sahoo**,***** S. Dhara, S. Dash, A. K. Tyagi, *Photo-assisted local oxidation, and fragmentation by ultra-small Pt nanoclusters functionalized single GaN Nanotubes*;

    J. Nanoparticle Research 14 (2012) 1103.

33. **Prasana Sahoo**, J. Basu, S. Dhara, H. C. Fang, C. P. Lu, T. R. Ravindran, S. Dash and A. K. Tyagi, *Single step growth dynamics and multi-functional properties of core-shell GaN on Ga_2O_3 freestanding microbelts;* **J. Material Science 47 (2012) 3447.**

34. A. Patsha, **Prasana Sahoo**, S. Dhara, S. Amrithapandian, A. K. Tyagi, *Probing Crystallographic Orientation of a single GaN nanotube using polarized Raman imaging;* **J. Raman Spectroscopy 44 (2012) 651.**

35. **Prasana Sahoo**, D. Oliveira, M. A. Cotta, S. Dhara, S. Dash, A. Tyagi, B. Raj, *Enhanced surface potential variation on nanoprotrusions of GaN microbelt as a probe for humidity sensing;* **J. Physical Chemistry C 115 (2011) 5863.**

36. **Prasana Sahoo**,***** S. Dhara, S. Dash, I. Manna, B. Raj, A. K. Tyagi, *Air trapped nano-cavity induced superhydrophobicity on GaN microbelt;* **Applied Physics Letter 98 (2011) 043103**.

    [Featured Article in **Nature India;** *Water Repelling Surface Sensor,* **2011,** doi:10.1038/nindia.2011.31.

    Virtual J. of Nanoscale Science & Technology, 23 (5) 2011]

37. **Prasana Sahoo**,***** S. Dhara, S. Dash, A. K. Tyagi, *One Dimensional GaN Nanostructures: Growth Kinetics and Applications;* **Nanoscience & Nanotechnology-ASIA 1 (2011) 140-170.** *(Invited Review)*

38. **Prasana Sahoo**, S. Dhara, C. R. Das, S. Dash, A. K. Tyagi, B. Raj, P. Chandramohan, M. P. Srinivasan*, Surface optical modes in GaN nanowires;* **Int. J. Nanotechnology 7 (2010) 823.**

XII. Invited Talk/Seminar Presentation

1. 2022, 19-23 December, International Union of Materials Research Societies and International Conference in Asia, IUMRS ICA 2022, IIT Jodhpur *(Scheduled)*
2. 2022, 12-14 December, 6th *IEEE* International Conference on Emerging Electronics (*ICEE*), Bangalore, India *(Scheduled)*
3. 2022, Sept 18-22, Quantum Condensed Matter Conference (Q-MAT), IIT Kanpur
4. 2022, March15-19, Faculty Development Programme on "Recent Trends In VLSI And Nano-Electronics: The Materials-Based Device Technology", NIT Andhra Pradesh
5. 2022, March14-17, Workshop on Functional Materials for Emerging Technology 2022, SIT, Bhubaneswar.
6. 2021, July 12-16, Intensive Course in Layered Materials and Applications, Institute of Emerging Technologies, Hellenic Meditteranean University, Greece
7. 2021, 21 August, 4th lecture in ELECTRONICS COMMUNICATION WEEKEND WEBINAR (ECWW) series, Siksha 'O' Anusandhan University, Bhubaneswar.
8. 2021, 2-4 June, Thematic National conference on "Low dimensional Materials: Growth, optical and Electronic properties (LDMAT-2021), organized by CEBS, Mumbai and MRSI-MC.
9. 2021, May 19-21, International Conference on Light Matter Interaction (IC-LMIN-2021), DAE-IGCAR, Kalpakkam.
10. 2021, 2-5 March, Workshop on Functional Materials for Emerging Technology, FMET-2021, SIT Bhubaneswar.
11. 2020, 26-28 Nov, 5th International conference on Emerging Electronics (IEEE-ICEE 2020), IIT Delhi,
12. 2020 22-24 January 2021 33rd Annual Conference of Orissa Chemical Society and National Conference on Recent Advancement in Material Sciences (RAIMS 2019), VSSUT, Burla
13. 2020, 6-8 Nov, International Webinar on Recent Advances in Science and Technology (RAST-2020), IGIT Sarang, Odisha
14. 2020, 27-28 August, International Virtual Conference on Advances in Functional Materials (AFM 2020), Kalinga Institute of Industrial Technology, (KIIT), Institute of Eminence, Bhubaneswar, Odisha.
15. 2020, 8–9 May, Webinar on Material Science, Technology & Society, School of Physical Sciences, Dept. Physics, JNU University, New Delhi.
16. 2020, 07 March, One Day Discussion Meeting on Spectroscopy, Photonics, Dynamics (SPD-2020), Centre for Advanced Functional Materials (CAFM), Indian Institute of Science Education & Research (IISER) Kolkata.
17. 2020, 5-7 March, International Conference on Nanoscience And Technology (ICONSAT), Kolkata.
18. 2020, 24-28 February, The VIII International Conference on Perspectives in Vibrational Spectroscopy (ICOPVS)- 2020, JNCASR, Bangalore.
19. 2020, 3-7 Feb, 12th Asia Pacific Microscopy Conference (APMC) & XL (40th) Annual Meeting of EMSI,

Hyderabad.

20. 2020, 8-9 Feb, National Seminar on Role of Physics in Technological Advances (NSRPTA-2020) & 37th Convention of Orissa Physical Society (OPS), Sambalpur, India.
21. 2019, 18-22 Dec, DAE Solid State Physics Symposium, IIT Jodhpur, Rajasthan, India.
22. 2019, 17-20 Dec, XXth International Workshop on Physics of Semiconductor Devices *(IWPSD)*, Kolkata, India.
23. 2018, 1-2 Dec, National Workshop on Advanced Materials & Applications, Siksha 'O' Anusandhan University, Bhubaneswar, India,
24. 2017, 23-29 July, Texas A&M-Princeton-Baylor Summer Symposium on Quantum Science and Engineering, Casper College, Wyoming, USA
25. 2016, Jan, Emerging Trends in Advanced Functional Materials, Institute of Physics, Bhubaneswar, India.
26. 2014, April 28, Department of Physics, University of Louisville, Louisville, Kentucky, USA.
27. 2013, Nov 26-29, Indo-Brazil-South Africa (IBSA) workshop on Nanotechnology, Curitiba, Brazil.

XIII. Conference Presentations (** Contributory Presentation*)

1. Controlled growth of transition metal dichalcogenides twisted bilayers, and heterostructures, Prasana K. Sahoo* et al. **2019, Graphene Week 2019, Helsinki, Finland**
2. Two dimensional lateral heterostructures and superlattices: controlled growth and nano-optical imaging, Prasana Sahoo* *et al.* **2018**, **Gordon Research Conference**, **Two Dimensional Electronics Beyond Graphene**, MA, USA.
3. Transport properties of mono and bi-layered lateral heterostructures of transition metal dichalcogenides, Prasana Sahoo *et al* **2018**, **Gordon Research Conference**, **Two Dimensional Electronics Beyond Graphene**, MA, USA.
4. *Multi-junction lateral 2D heterostructures of transition metal dichalcogenides via sequential edge epitaxy*, Prasana Sahoo *et al.*, **2018, APS March Meeting**, **Los Angeles, California, USA**.
5. One-pot growth of 2D lateral superlattices via vapor phase modulation, Prasana Sahoo *et al.* **2018, APS March Meeting**, **Los Angeles, CA, USA**.
6. *Tunable band gap coupling in 2D heterostructures based on ternary alloys of transition metal dichalcogenides*, F. Nugera, Prasana Sahoo *et al.,* **2018, APS March Meeting**, **Los Angeles, USA**.
7. *Multi-Junction Lateral 2D Heterostructures of Transition Metal Dichalcogenides*, Prasana K. Sahoo* *et al.,* **2017**, **AVS 64th International Symposium and Exhibition, Tampa, FL, USA.**
8. *In situ laser induced chemical modification of ultrathin $MoSe_2$*, Prasana Sahoo* *et al.,* **2017, 2nd International Symposium on Science and Technology of 2D materials, Orlando, FL, USA.**
9. *Synthesis and Characterization of 2-D Materials,* S. Pazos, Prasana Sahoo *et al.,* **2017, APS March Meeting, New Orleans, USA.**
10. *Site Selective Photo-Conversion of Ultrathin WSe_2 to WS_2*, Prasana Sahoo* *et al.,* **2016, MRS Fall Meeting & Exhibit, Boston, USA.**
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