

Gde Bimananda Mahardika Wisna

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EDUCATION

PhD in Physics Arizona State University, US	August 2020-August 2025 (expected)
MS in Materials Science and Engineering, summa cum laude University of California San Diego, US	September 2017-June 2019
BS in Engineering Physics, summa cum laude Institut Teknologi Bandung, Indonesia	August 2011-April 2016

TEACHING AND MENTORING EXPERIENCE

Research mentor for undergraduate students 5 undergraduate students in total, Arizona State University, US	August 2023-present
Teaching assistant of PHY 131 icourse Department of Physics, Arizona State University, US	August 2023-present
Teaching assistant of PHY 112 General Physics Department of Physics, Arizona State University, US	January 2023-May 2023
Teaching assistant of Advanced Biophysics Lab Department of Physics, Arizona State University, US	August-December 2020
Teaching assistant of Fluid Mechanic course Engineering Physics Department, Institut Teknologi Bandung, Indonesia	January 2014 -May 2014
Laboratory assistant of Engineering Physics I Laboratory Engineering Physics Department, Institut Teknologi Bandung, Indonesia	August-December 2013
Teaching assistant of Fundamental of Electric and Electronic Circuit course Engineering Physics Department, Institut Teknologi Bandung, Indonesia	August-December 2013

RESEARCH EXPERIENCE

Bionics Lab (Rizal Hariadi's Group). PI: Rizal Fajar Hariadi, Ph.D Biodesign Institute, Arizona State University, US	August 2020-Present
Zhaowei Liu's Group. PI: Zhaowei Liu, Ph.D Electrical and Computer Engineering Department, University of California San Diego, US	September 2017-August 2020
Bionics Lab (Rizal Hariadi's Group). PI: Rizal Fajar Hariadi, Ph.D Biodesign Institute, Arizona State University, US	April 2017-July 2017
Advanced Material Laboratory. PI: Dr. Eng. Nugraha Engineering Physics Department, Institut Teknologi Bandung, Indonesia	August 2015-April 2016
Quantum Nano Electronics Research Center (QNERC). PI: Shunri Oda, PhD Physical Electronics Department, Tokyo Institute of Technology, Japan	September 2014-August 2015
High Momentum Particle Identification Detector. PI: Antonio Di Mauro, Ph.D ALICE Department, CERN, Geneva, Switzerland	June 2014-August 2014
Physics Teacher Centrion Institute-National Science Olympiad Training Institution for Senior High School, Indonesia	February 2013-June 2014

PEER-REVIEWED SCIENTIFIC PUBLICATIONS

- **G. B. M. Wisna**, R. Sasmal, N. Acharya, H. Yan, R. F. Hariadi. DNA strand displacement of amphipilic duplex DNA on and across phospholipid bilayer. *In preparation*
- N. Acharya, R. Sasmal, **G. B. M. Wisna**, S. Dey, Y. Liu, H. Yan, R. F. Hariadi. Non-destructive, exogenous stain for membrane-enclosed oligonucleotides composed of cholesterol modified DNA nanostructure. *In preparation*
- S. Pradhan, C. Swanson, C. Leff, I. Tenggana, M.H. Bergeman, **G. B. M. Wisna**, I.B. Hogue, R. F. Hariadi. Viral Attachment blocking chimera composed of DNA origami and nanobody inhibits Pseudorabies Virus infection in vitro. *ACS Nano*. Accepted 2023
- **G. B. M. Wisna**, D. Sukhareva, J. Zhao, D. Satyabola, M. Matthies, S. Roy, P. Sulc, H. Yan, R. F. Hariadi. High-speed 3D DNA-PAINT and Unsupervised clustering for unlocking 3D DNA origami cryptography. *BioRxiv*. 2023
- Y. U. Lee, S. Li, **G. B. M. Wisna**, J. Zhao, Y. Zeng, A.R. Tao, Z. Liu. Hyperbolic material enhanced scattering nanoscopy for label-free super-resolution imaging. *Nat. Comm*. 2022
- Y. U. Lee, Z. Nie, S. Li, C. H. Lambert, J. Zhao, F. Yang, **G. B. M. Wisna**, S. Yang, X. Zhang, Z. Liu. Ultrathin layered hyperbolic metamaterial-assisted illumination nanoscopy. *Nano Lett*. 2022

- Y. U. Lee, J. Zhao, Q. Ma, L. K. Khorashad, C. Posner, G. Li, **G. B. M. Wisna**, Z. Burns, J. Zhang, Z. Liu. Metamaterial assisted illumination nanoscopy via random super-resolution speckles. *Nat. Comm.* 2021
- Y. U. Lee, C. Posner, Z. Nie, J. Zhao, S. Li, S. E. Bopp, **G. B. M. Wisna**, J. Ha, C. Song, J. Zhang, S. Yang, X. Zhang, Z. Liu. Organic hyperbolic material assisted illumination nanoscopy. *Advanced Science*. 2021
- Y. U. Lee, **G. B. M. Wisna**, J. Zhao, S. W. Hsu, M. Lei, S. Li, A. R. Tao, Z. Liu. Imaging of nanoscale light confinement in plasmonic nanoantennas by brownian optical microscopy. *ACS Nano*. 2020
- M. Simanullang, **G. B. M. Wisna**, K. Usami, S. Oda. Synthesis and haracterization of Ge-core/Si-shell nanowire with conformal shell thickness deposited after gold removal for high-mobility p-type field-effect transistor. *Nanoscale Advances*. 2020
- M. Simanullang, **G. B. M. Wisna**, K. Usami, W. Cao, K. Banerjee, Y. Kawano, S. Oda. Undoped and catalyst-free germanium nanowires for high-performance p-type enhancement-mode field-effect transistors. *J of Materials Chemistry C*. 2016

CONFERENCE PAPER, ABSTRACT AND PRESENTATIONS

*Presenting the talk/poster

- **G.B.M. Wisna***, R. Sasmal, Y. Hassan, P. Chopade, R. F. Hariadi. Stretching the limits: Unleashing the power of DNA origami force clamp for high-throughput single-molecule biophysics under multi-axial tension. *FNANO23 conference*. 2023 (poster presentation)
- R. Sasmal, **G. B. M. Wisna**, Y. Hassan, C. Swanson, H. Yan, R. F. Hariadi*. Short amphiphilic DNA hairpins for DNA-gated nanopores and signal transduction across membrane. *FNANO23 conference*. 2023 (invited talk)
- D. Sukhareva*, **G. B. M. Wisna**, J. Zhao, D. Satyabola, S. Roy, M. Matthies, P. Sulc, H. Yan, R. F. Hariadi. Using DNA origami nanostructures and #D DNA-PAINT to create strong cryptography. *FNANO23 conference*. 2023 (poster presentation)
- N. Acharya*, A. Singam, **G. B. M. Wisna**, R. Sasmal, S. Dey, C. Swanson, H. Yan, R. F. Hariadi. Sensing with minimal scarring: Detection of luminal nucleic acid targets using transmembrane DNA nanosensors. *FNANO23 conference*. 2023 (poster presentation)
- **G. B. M. Wisna***, N. Acharya, T. Mukherjee, R. Sasmal, H. Yan, R. F. Hariadi. Single-pass transmembrane dsDNA with functional toeholds for non-destructive intra-and extravesicular target detection. *DNA28 conference*. 2022 (oral and poster presentation)
- **G. B. M. Wisna***, D. Sukhareva, J. Zhao, R. Warriar, V. McGill-Adami, H. Yan, R. F. Hariadi. Molecular cryptography enabled by DNA origami, DNA-PAINT and machine learning. *FNANO22 conference*. 2022 (oral presentation)
- N. Acharya*, **G. B. M. Wisna***, et al. Non-invasive Detection of Nucleic Acid Targets Inside Lipid Vesicles Using Transmembrane DNA Nanosensor. *Biophysical Annual Meeting*. 2022 (Poster Presentation)
- J. Zhao*, Y. U. Lee, Q. Ma, L. K. Khorashad, C. Posner, G. Li, **G. B. M. Wisna**, Z. Burns, J. Zhang, Z. Liu. *Novel Techniques in Microscopy*. *Optical Society of America*. 2021 (presentation and abstract published online)
- M. Simanullang*, **G. B. M. Wisna**, K. Usami, W. Cao, K. Banerjee, S. Oda. Electrical characterization of back-gated and top-gated germanium-core/silicon-shell nanowire field-effect transistors. *IEEE SNW, Hawaii, USA*. 2016 (presentation and abstract published online)
- M. Simanullang*, **G. B. M. Wisna**, T. Noguchi, K. Usami, S. Oda. Synthesis of ge-core/si-shell nanowires with conformal shell thickness deposited after au removal. *28th International Microprocesses and Nanotechnology Conference, Japan*. 2015 (presentation)

PATENTS

- R. F. Hariadi, **G. B. M. Wisna** and R. Sasmal, Compositions and methods related to nucleic acid sensors, U.S. US patent application No. PCT/US2023/063860, filing date March 7, 2023.

BOOK AND MASS MEDIA PUBLICATIONS

- Post Asian Games: Incentives for Research. The Jakarta Post. 2018
- Mekanika Olimpiade Fisika SMA/MA: Intensif teori, soal dan pembahasan. Grasindo. 2018 (In Indonesian Language)

HONORS AND AWARDS

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| • ASU Department of Physics Summer Research Fellowship | June-August 2023 |
| • 2023 AHA predoctoral fellowship | Jan 2023-Dec 2024 |
| • LPDP-Indonesia Endowment Fund for Education | 2016 |
| • Congratulatory speech addresser representing international students in Exchange Program Completion Ceremony, at Tokyo Institute of Technology | 2015 |
| • JASSO Scholarship for Exchange Program at Tokyo Institute of Technology | 2014-2015 |
| • Associated Member of Summer Student of CERN | 2014 |

- The best student of Engineering Physics Department, Institut Teknologi Bandung **2014**
- Bronze medal in Physics in National Science and Mathematics for University held by The Directorate General of Higher Education of Republic Indonesia **2012**
- General Electric (GE) Foundation Scholar-Leaders Program Grantee **2012-2015**
- The best first year student, Faculty of Industrial Technology, Institut Teknologi Bandung **2012**
- The top 12 in selection process for IPhO 2011 Indonesia Team **2011**
- Gold medal in physics in National Science IX Olympiad for Senior High School held by The Directorate General of Secondary Education of Republic Indonesia **2010**

Mentored students

- Daria Sukhareva (ASU Biochemistry Undergraduate) **2020-2023**
- Jonathan Zhao (ASU Computer Science and Engineering Undergraduate) **2021-2022**
- Vaughn Mc-Gill Adami (ASU Computer Science Undergraduate) **2021-2021**
- Ritvik Warriar (ASU Computer Science Undergraduate) **2021-2022**
- Raymond Nucuta (ASU Computer Science Undergraduate) **2022-2022**

SEMINAR AND WORKSHOP

- Workshops in Particle Physics, accelerator, and detector at CERN Summer Student Program **2014**
- Leadership Development Seminar held by GE Indonesia and IIEF in Jakarta, Indonesia **2013**

TECHNICAL SKILLS

- Experiment Equipment: Talos Transmission Electron Microscope, FCS and FCCS EI-Flex instrument, Zeiss confocal microscope, Oxford Nano Imager fluorescent microscope(single molecule FRET and super-resolution DNA-PAINT imaging), wet bench skills, Bruker AFM, UV-VIS nanodrop, UV-VIS plate reader, UV-VIS spectrometer, Agarose and PAGE gel set up, FPLC, HPLC, Heidelberg MLA 150, Karl Suss MA6 Aligner, FE-SEM Hitachi 4500, Temescal BJD-1800 Electron Beam Evaporator, Oxford Plasmalab PECVD, Oxford Plasmalab 80, Denton Discovery 635 Sputtering, FEI Apreo SEM, FEI FIB, Spin coater, Oxidation Furnace, Atomic Layer Deposition Reactor, I-V measurement Cascade Microtech, Optical Microscope, optical set up building.
- Programming language: Matlab, Python, C++
- Computer aided software: AutoCad, Comsol Multiphysics (wave optics, electrostatic), Solid Works, Labview, Nupack, Cadnano, Picasso DNA-PAINT
- Other: Windows OS, Linux Ubuntu (basic), Microsoft Office, Corel Draw, Adobe Illustrator

PROFESSIONAL MEMBERSHIP

- American Physical Society **2022-Present**
- Biophysical Society **2022-Present**
- American Heart Association **2022-2023**
- International Society for Nanoscale Science, Computation and Engineering (ICSNCE) **2020-Present**