Annual Report 2024

PHOTONICS RESEARCH LABORATORY

Photonics Group
National Institute of Physics
UP Diliman, Quezon City
September 30, 2024

Prepared by:

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Senior Office Aide

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PRL Coordinator

Period Covered: January 1, 2024 – December 31, 2024

Submitted: April 15, 2025

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1 Executive Summary

1.1 Activities of the research group

1.1.1 Organization

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Adjunct Member		**1**
Student Members		**44**
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Material Science and Engineering	2	
Master of Science students (9)		
Physics	5	
Material Science and Engineering	4	
Bachelor of Science students (16)		
Applied Physics	11	
Physics	5	
Apprentices (9)		
BS Applied Physics	5	
BS Physics	4	
Total		**50**

1.1.2 Mentoring

		Number of Graduates
PhD Physics		1
MS Physics		1
BS Applied Physics		3
BS Physics		6
	Total	11

1.2 Research highlights

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1.3 Extension work highlights

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1.5 Awards or accreditations received/ positions of responsibility held and other accomplishments

National awards or accreditation received, positions of responsibility held	0
International awards or accreditations received, positions of responsibility held	0
Student awards	6

2 Technical Report

2.1 Activities of the research group

- The Photonics Research Laboratory continues to hold weekly group meetings. The three clusters of the laboratory also have separate research meetings every week.
- The group has participated in conferences held internationally and domestically.
- The group helped graduate 1 PhD Physics student.
- The group helped graduate 1 MS Physics student.
- The group helped graduate 6 BS Physics students.
- The group helped graduate 2 BS Applied Physics (Instrumentation) students.

2.1.1 Organization

2.1.1.1 Group members

Regular members (5)

1. Garcia, Wilson O.
2. Almoro, Percival F.
3. Hermosa, Nathaniel II
4. Zosa, Myles Allen H.
5. Zambale-Simon, Niña Angelica F.

Adjunct member (1)

1. Dasallas, Lean (Material Science and Engineering Program, College of Science)

Doctor of Philosophy students

Physics (8)	Years in Program	Cluster	Adviser	Co-adviser
1. Baybayon, Roel	3	SLA	Dr. Hermosa	
2. Binamira, Jonel	5	HCM	Dr. Almoro	
3. Buco, Christian	4	HCM	Dr. Almoro	
4. Cabanilla, Jayson	6	SLA	Dr. Hermosa	
5. Emperado, Rommil	9	LSA	Dr. Garcia	Dr. Zosa
6. Miranda, Jessa Jayne	7	LSA	Dr. Zosa	
7. Onglao, Mario III	9	HCM	Dr. Almoro	
8. Pablico, Dennis Angelo	2	SLA	Dr. Hermosa	
Material Science and Engineering (2)				
1. De Mata, Joy Kristelle	5	LSA	Dr. Dasallas	
2. Sagisi, Jenny Lou	8	LSA	Dr. Dasallas	

Master of Science students

Physics (5)	Years in Program	Cluster	Adviser
1. Badlisan, Marsden	3	SLA	Dr. Hermosa
2. Grefal, Jesse Rudyll	2	LSA	Dr. Zosa
3. Ignacio, Emmanuel John	1	SLA	Dr. Hermosa
4. Logarta, Arrianne Norfela	1	LSA	Dr. Zosa

5. Quimpo, Evanghelos	1	LSA	Dr. Zosa
Material Science and Engineering (4)	Years in Program	Cluster	Adviser
1. Carillo, Patricia Mae	2	LSA	Dr. Dasallas
2. Nagal, Danell Jeune	2	LSA	Dr. Dasallas
3. Operaña, Jared Joshua	5	SLA	Dr. Hermosa
4. Valdeavilla, Charlyn	1	LSA	Dr. Dasallas

Bachelor of Science students

Applied Physics (11)	Years in Program	Cluster	Adviser
1. Aclan, Nicole	5	HCM	Dr. Almoro
2. Alipio, Miguel Lorenzo	5	LSA	Dr. Garcia
3. Armonio, Nathan	4	HCM	Dr. Almoro
4. Borjel, Rusher	5	HCM	Dr. Almoro
5. Casupang, John Christian	5	HCM	Dr. Almoro
6. Clemente, Lance Veyonce	4	HCM	Dr. Almoro
7. David, Justin Matthew	5	HCM	Dr. Almoro
8. Dumas, Danielle Louis	4	HCM	Dr. Almoro
9. Reyes, Arianne	5	HCM	Dr. Almoro
10. Villanueva, Luisito	5	SLA	Dr. Hermosa
11. Quiamjot, Allyn Christian	4	LSA	Dr. Garcia
Physics (5)			
1. Estacio, Damien	4	SLA	Dr. Hermosa
2. Fernando, Aira Joie	4	LSA	Dr. Zosa
3. Leonor, Clara Patricia	5	LSA	Dr. Garcia
4. Mendoza, Maria Isabella	5	SLA	Dr. Hermosa
5. Utsumi, Yoshi	5	HCM	Dr. Almoro

**Research Clusters:*

HCM *(Holography and Coherent Metrology),* ***SLA*** *(Structured Light and Applications), and* ***LSA*** *(Laser Systems and Applications)*

Apprentices

BS Applied Physics (5)	Years in Program
1. Cruz, Vanessa Angela	2
2. Ibay, Dominic Job	3
3. Pangilinan, Benedict	2
4. Romeo, Kal-El	2
5. Salenga, Rajah	2

BS Physics (4)

1. Ebron, Mark David 3
2. Obeña, Emmanuel Christian 3
3. Sy, Ethan Lorenz 2
4. Tagapulot, Nathaniel Dave 2

2.1.2 Mentoring

2.1.2.1 List of Graduates (11)

1st Semester 2023-2024 (5)

1. **Zambale-Simon, Niña Angelica F.** (Ph.D. Physics)
   "Structured Light: Generation, Detection, and Application"
   (Adviser: Nathaniel P. Hermosa II, Ph.D.)
2. **Ambrosio, Benjamin Jose C.** (BS Applied Physics – Instrumentation, *Cum Laude*)
   "Locating the Sun Using a DIY Radial Polarizer"
   (Adviser: Nathaniel P. Hermosa II, Ph.D.)
3. **Buensuceso, Cedie E.** (BS Applied Physics – Instrumentation, *Magna Cum Laude*)
   "Gas Leak Detection Using DC Glow Discharge"
   (Adviser: Wilson O. Garcia, Ph.D.)
4. **Cabalar, Vincent A.** (BS Physics)
   "Simulation of Pulsed Laser Deposition on Eclipsed Substrate by DSMC Using Sparta"
   (Adviser: Wilson O. Garcia, Ph.D.)
5. **Cuadra, Marco L.** (BS Physics, *Magna Cum Laude*)
   "Faster Convergence in Multiple-Plane Phase Retrieval Using Particle Swarm

Optimization"
(Adviser: Percival F. Almoro, Ph.D.)

2nd Semester 2023-2024 (5)

1. **Manuel, Maria Janelle G.** (MS Physics)
   "Spiral Spectrum of Starlight"
   (Adviser: Nathaniel P. Hermosa, Ph.D.)
2. **Ignacio, Emmanuel John E.** (BS Physics, *Summa Cum Laude*)
   "Engineering Polarization Singularities with Multiple-Pinhole Diffraction"
   (Adviser: Nathaniel P. Hermosa II, Ph.D.)
3. **Logarta, Arrianne Norfela A.** (BS Physics, *Magna Cum Laude*)
   "Θ-Pinch Mechanism in Paisley Targets Using Relativistic Femtosecond Lasers Via Epoch Particle-in-Cell Code Simulation"
   (Adviser: Myles Allen H. Zosa, Ph.D.)
4. **Loot, Angela Joyce T.** (BS Physics)
   "Simulating Coulomb Explosion Using Python-Fortran Hybrid Program"
   (Adviser: Myles Allen H. Zosa, Ph.D.)
5. **Quimpo, Evanghelos D.** (BS Physics, *Magna Cum Laude*)
   "Micro-Pillar Surface Orientation and Its Effects on Proton Beams Generated Via Target Normal Sheath Acceleration"
   (Adviser: Myles Allen H. Zosa, Ph.D.)

Midyear 2024 (1)

1. **Abenojar, Joshua** (BS Applied Physics)
   "Enhanced Single-Beam Multiple-Plane Reconstruction using Fresnel Impulse Response Propagation"
   (Adviser: Percival F. Almoro, Ph.D.)

2.1.2.2 Summary

	Number of Graduates
PhD Physics	1
MS Physics	1
BS Applied Physics	3
BS Physics	6
Total	11

2.2 Research highlights

2.2.1 Publications in ISI/SCI and Scopus indexed journals (7)

1. A. Tuico, J. P. Ferrolino, N. I. Cabello, I. C. Verona, **W. Garcia**, A. Salvador, H. Bardolaza, E. Estacio, and A. De Los Reyes, Polarization characteristics of Ni/Pt-based spintronic terahertz emitters based on spin electron dynamics, Jpn. J. Appl. Phys. 63, 062005 (2024). doi:10.35848/1347-4065/ad52d9
2. D. G. C. Banguilan and **N. Hermosa**, The use of a vortex beam to determine the limit of a digital micromirror device as an aperture, Optics & Laser Technology 179, 111250 (2024). doi:10.1016/j.optlastec.2024.111250
3. D. G. C. Banguilan and **N. Hermosa**, Vortex position detection using a scanning triangular aperture in a digital micromirror device, J. Opt. 26, 065602 (2024). doi:10.1088/2040-8986/ad3b16
4. **J. K. De Mata**, M. Valenzona, A. Lacaba, **W. Garcia**, and **L. Dasallas**, Low energy femtosecond pulsed laser ablation of Nd:YAG laser crystal in high-pressure oxygen and nitrogen background gas, Jpn. J. Appl. Phys. 63, 055503 (2024). doi:10.35848/1347-4065/ad3c01
5. **J. L. B. Sagisi**, **W. O. Garcia**, and **L. L. Dasallas**, Modification of the temporal laser source term in two-temperature model, Numerical Heat Transfer, Part A: Applications 1 (2024). doi:10.1080/10407782.2024.2350687
6. **J. L. Sagisi**, M. R. Casero, A. L. Floro, M. C. Salvador, R. Dizon, **W. Garcia**, and **L. Dasallas**, Modelling thermal energy transfer in a femtosecond pulsed laser ablation of metal using a coupled spring-mass oscillator, Phys. Scr. 99, 046101 (2024).

doi:10.1088/1402-4896/ad2f90

7. **M. J. S. Onglao** and **P. F. Almoro**, Accelerated phase retrieval using adaptive support and statistical fringe processing of phase estimates, Opt. Lett. 49, 3158 (2024). doi:10.1364/OL.522321.

2.2.2 Publication in local peer-reviewed journals (1)

1. MM Rosete, **MAH Zosa** and RV Sarmago, Effect of Cold-bath Quenching on Electrophoretically Deposited $Bi_2Sr_2CaCu_2O_8$ Films with Various Supporting Electrolytes, Philippine Engineering Journal 45, 02 (2024).

2.2.3 International conference presentations with full papers (2)

2. **J. F. Binamira** and **P. F. Almoro**, Removal of local phase errors in conventional speckle phase retrieval using random phase patch perturbation method, Speckle 2023: VIII International Conference on Speckle Metrology 77 (2024). doi:10.1117/12.3022655
3. **P. F. Almoro** and **C. R. L. Buco**, Noise-robust phase compensation using principal component analysis with guided parameter adjustment, Speckle 2023: VIII International Conference on Speckle Metrology 69 (2024). doi:10.1117/12.3021808

2.2.4 International conference presentations without full papers (1)

1. **J.J.C. Miranda,** M. Murakami, **M.A.H. Zosa** and **W.O. Garcia,** "Magnetic field amplification in layered hollow cylindrical target" Optics and Photonics International Congress (OPIC) 2024 – International Conference on High Energy Density Science (HEDS) 2024, April 22-26, 2024, Yokohama, Japan. (Poster presentation)

2.2.5 International conference presentations with full papers (locally held) (33)

1. **ACI Quiamjot**, **MLM Alipio**, **LL Dasallas**, **MAH Zosa**, and **WO Garcia**, Radiographic imaging of aluminum objects at varying distances using Americium-241 decay, *Proceedings of the Samahang Pisika ng Pilipinas 42*, SPP-2024-PD-24 (2024). URL: https://proceedings.spp-online.org/article/view/SPP-2024-PD-24.

2. **AJM Fernando** and **MAH Zosa**, Electron distribution model in bilayered finite spherical plasmas, *Proceedings of the Samahang Pisika ng Pilipinas 42*, SPP-2024-PD-01 (2024). URL: https://proceedings.spp-online.org/article/view/SPP-2024-PD-01.
3. **ANA Logarta** and **MAH Zosa**, Demonstration of the θ-pinch effect on double paisley targets using relativistic femtosecond lasers, *Proceedings of the Samahang Pisika ng Pilipinas 42*, SPP-2024-3C-03 (2024). URL: https://proceedings.spp-online.org/article/view/SPP-2024-3C-03.
4. **CE Buensuceso**, **JKC De Mata**, **LL Dasallas**, and **WO Garcia**, Gas leak detection using DC glow discharge, *Proceedings of the Samahang Pisika ng Pilipinas 42*, SPP-2024-PD-06 (2024). URL: https://proceedings.spp-online.org/article/view/SPP-2024-PD-06.
5. CJC Andres, FR Gile, CYC Seki, RG Dizon, **JKC de Mata**, **WO Garcia**, and **LL Dasallas**, Numerical study on the effects of directionality of argon background gas in the propagation of pulsed laser ablated materials, *Proceedings of the Samahang Pisika ng Pilipinas 42*, SPP-2024-PD-25 (2024). URL: https://proceedings.spp-online.org/article/view/SPP-2024-PD-25.
6. **CPP Leonor**, **JJC Miranda**, and **WO Garcia**, Viability of smartphone spectroscopy as an alternative for UV-Vis spectroscopy experiments, *Proceedings of the Samahang Pisika ng Pilipinas 42*, SPP-2024-PF-10 (2024). URL: https://proceedings.spp-online.org/article/view/SPP-2024-PF-10.
7. **CRL Buco** and **PF Almoro**, Virtual wave propagation using a digital micro-mirror device with diamond pixel configuration, *Proceedings of the Samahang Pisika ng Pilipinas 42*, SPP-2024-PD-12 (2024). URL: https://proceedings.spp-online.org/article/view/SPP-2024-PD-12.
8. **DAL Pablico**, **NAZ Simon**, and **NP Hermosa**, Using light-dependent resistors to detect rotation of petal beams, *Proceedings of the Samahang Pisika ng Pilipinas 42*, SPP-2024-PD-23 (2024). URL: https://proceedings.spp-online.org/article/view/SPP-2024-PD-23.
9. **DMM Estacio**, **NZ Simon**, and **NP Hermosa**, Radon transform in OAM interference for sub wavelength displacement measurement, *Proceedings of the Samahang Pisika ng Pilipinas 42*, SPP-2024-PD-20 (2024). URL: https://proceedings.spp-online.org/article/view/SPP-2024-PD-20.

10. **ED Quimpo** and **MAH Zosa**, Micro-pillar surface orientation and its effect on laser-accelerated proton beam quality, *Proceedings of the Samahang Pisika ng Pilipinas 42*, SPP-2024-2D-04 (2024). URL: https://proceedings.spp-online.org/article/view/SPP-2024-2D-04.
11. **EJE Ignacio** and **NP Hermosa**, Generation of C-point and L-line polarization singularities with a 3-pinhole diffraction setup, *Proceedings of the Samahang Pisika ng Pilipinas 42*, SPP-2024-PD-09 (2024). URL: https://proceedings.spp-online.org/article/view/SPP-2024-PD-09.
12. FMR Tortoza, **N Simon**, **N Hermosa**, and RC Simon, Determining the slit dimensions of a double-slit aperture through measuring laser diffraction intensity with a light-dependent resistor, *Proceedings of the Samahang Pisika ng Pilipinas 42*, SPP-2024-PD-07 (2024). URL: https://proceedings.spp-online.org/article/view/SPP-2024-PD-07.
13. **JF Binamira** and **PF Almoro**, Accelerated unordered propagation phase retrieval using grid-like pattern as initial guess phase, *Proceedings of the Samahang Pisika ng Pilipinas 42*, SPP-2024-PD-05 (2024). URL: https://proceedings.spp-online.org/article/view/SPP-2024-PD-05.
14. **JJC Miranda** and **MAH Zosa**, Effects of laser polarization on magnetic field time evolution in gold-coated hollow cylindrical hydrogen targets, *Proceedings of the Samahang Pisika ng Pilipinas 42*, SPP-2024-3C-01 (2024). URL: https://proceedings.spp-online.org/article/view/SPP-2024-3C-01.
15. JM Abenojar and **PF Almoro**, Accelerated multiple plane phase retrieval using impulse response propagation method, *Proceedings of the Samahang Pisika ng Pilipinas 42*, SPP-2024-PF-19 (2024). URL: https://proceedings.spp-online.org/article/view/SPP-2024-PF-19.
16. **JP Cabanilla** and **NP Hermosa**, Beam waist dependence in mode projection of Hermite-Gaussian beams, *Proceedings of the Samahang Pisika ng Pilipinas 42*, SPP-2024-PD-21 (2024). URL: https://proceedings.spp-online.org/article/view/SPP-2024-PD-21.
17. **JRB Grefal** and **MAH Zosa**, Polarization effects on magnetic fields generated via relativistic laser interactions with escargot targets, *Proceedings of the Samahang Pisika ng Pilipinas 42*, SPP-2024-PD-11 (2024). URL: https://proceedings.spp-

online.org/article/view/SPP-2024-PD-11.

18. J Tuanquin, HR Bardolaza, **NP Hermosa**, AA Salvador, ICM Verona, and ES Estacio, Experimental demonstration of a Michelson interferometer involving far-infrared broadband ultrashort light pulses, *Proceedings of the Samahang Pisika ng Pilipinas 42*, SPP-2024-PD-22 (2024). URL: https://proceedings.spp-online.org/article/view/SPP-2024-PD-22.

19. K Alaba, HR Bardolaza, **NP Hermosa**, and ES Estacio, Simulation of terahertz pulse with orbital angular momentum induced using spiral phase plate, *Proceedings of the Samahang Pisika ng Pilipinas 42*, SPP-2024-PD-08 (2024). URL: https://proceedings.spp-online.org/article/view/SPP-2024-PD-08.

20. KC Agustin, PKC Emano, JL Lopez, ID Pelaez, GA Punay, **RN Baybayon**, and MMS Villamayor, Design and operation of an acrylic chamber feather in a vacuum experiment, *Proceedings of the Samahang Pisika ng Pilipinas 42*, SPP-2024-PF-16 (2024). URL: https://proceedings.spp-online.org/article/view/SPP-2024-PF-16.

21. KJ Fernandez, RC Simon, HR Bardolaza, **JKC De Mata**, JDE Vasquez, R Andig, JMSC Arcilla, ICM Verona, AS Somintac, AA Salvador, ES Estacio, and CS Salang, Terahertz emission from AlN/SI-GaAs heterostructure investigated using transmission-geometry terahertz time-domain spectroscopy, *Proceedings of the Samahang Pisika ng Pilipinas 42*, SPP-2024-1B-05 (2024). URL: https://proceedings.spp-online.org/article/view/SPP-2024-1B-05.

22. KMD Carnaje, RAT Ramos, AJA Tadefa, CJ Ayala, and **LL Dasallas**, Assessment of low-cost alternative charcoal-based furnace in fabricating silicon carbide (SiC) nanostructures, *Proceedings of the Samahang Pisika ng Pilipinas 42*, SPP-2024-PA-16 (2024). URL: https://proceedings.spp-online.org/article/view/SPP-2024-PA-16.

23. **LL Villanueva**, **NZ Simon**, and **NP Hermosa**, Polarization lattice from the superposition of two triangular optical lattices with opposite orientations, *Proceedings of the Samahang Pisika ng Pilipinas 42*, SPP-2024-PD-13 (2024). URL: https://proceedings.spp-online.org/article/view/SPP-2024-PD-13.

24. **MIM Mendoza**, **N Hermosa**, and **N Zambale Simon**, Gaussian component of beams with fractional topological charge, *Proceedings of the Samahang Pisika ng Pilipinas 42*, SPP-2024-2C-04 (2024). URL: https://proceedings.spp-online.org/article/view/SPP-2024-2C-04.

25. MJG Manuel and **NP Hermosa**, Limits of vortex fiber nulling, *Proceedings of the Samahang Pisika ng Pilipinas 42*, SPP-2024-PD-19 (2024). URL: https://proceedings.spp-online.org/article/view/SPP-2024-PD-19.
26. **MJS Onglao** and **PF Almoro**, Performance of multiple-plane phase retrieval using intensity patterns at various regions near the image plane, *Proceedings of the Samahang Pisika ng Pilipinas 42*, SPP-2024-PF-17 (2024). URL: https://proceedings.spp-online.org/article/view/SPP-2024-PF-17.
27. **NZ Simon**, **MI Mendoza**, and **N Hermosa**, Vortex beams from incomplete holograms and phases, *Proceedings of the Samahang Pisika ng Pilipinas 42*, SPP-2024-PD-17 (2024). URL: https://proceedings.spp-online.org/article/view/SPP-2024-PD-17.
28. **RB Emperado**, **MAH Zosa**, **LL Dasallas**, and **WO Garcia**, Kinetic modeling of plume-shockwave interactions during laser-produced plasma expansion in background gas, *Proceedings of the Samahang Pisika ng Pilipinas 42*, SPP-2024-3C-02 (2024). URL: https://proceedings.spp-online.org/article/view/SPP-2024-3C-02.
29. **RB Emperado**, VA Cabalar, **LL Dasallas**, and **WO Garcia**, Direct simulation Monte Carlo modeling of eclipsed pulsed laser deposition using grid mesh-type masks, *Proceedings of the Samahang Pisika ng Pilipinas 42*, SPP-2024-PA-17 (2024). URL: https://proceedings.spp-online.org/article/view/SPP-2024-PA-17.
30. **RN Baybayon**, LJT Baldonado, **MI Badlisan**, and **NP Hermosa**, Statistical properties of a laser pointer speckle field at different propagating distances, *Proceedings of the Samahang Pisika ng Pilipinas 42*, SPP-2024-PD-14 (2024). URL: https://proceedings.spp-online.org/article/view/SPP-2024-PD-14.
31. **RN Baybayon** and **NP Hermosa**, White noise analysis of a speckle field with optical memory effect, *Proceedings of the Samahang Pisika ng Pilipinas 42*, SPP-2024-PD-18 (2024). URL: https://proceedings.spp-online.org/article/view/SPP-2024-PD-18.
32. JP Ferrolino , **JK De Mata**, EC Casalme, R Andig, C De Luna, MA Tumanguil, and A Salvador, Growth of c-axis oriented aluminium nitride with AI buffer layer via RF magnetron sputtering at low RF power and room temperature, *Proceedings of the Samahang Pisika ng Visayas at Mindanao (2024).*
33. GC Carillo, **JK De Mata,** JP Ferrolino, and A Salvador, Effects of etch stop layer thickness on the performance of piezo electric micromachined ultrasonic transducers simulated via finite element modelling, *Proceedings of the Samahang*

Pisika ng Visayas at Mindanao (2024).

2.2.6 Chapter in books (0)

2.2.7 Patents (0)

2.2.8 NIP funded projects (4)

Almoro, Percival F.

"Enhanced Phase Retrieval Using a Metaheuristic Algorithm"

Period: January 1, 2024 to December 31, 2024

Funding Source: NIP/ UP Diliman

Amount: ₱105,600.00

Garcia, Wilson O.

"Computer Modeling and Simulation of the Eclipsed PLD Method"

Period: January 1, 2024 to December 31, 2024

Funding Source: NIP/ UP Diliman

Amount: ₱105,600.00

Hermosa, Nathaniel P. II

"Fundamental Limit Vortex Fiber Nulling for Exoplanet Observation"

Period: January 1, 2024 to December 31, 2024

Funding Source: NIP/ UP Diliman

Amount: ₱105,600.00

Zosa, Myles Allen H.

"Relativistic laser-plasma interactions in microscale targets"

Period: January 1, 2024 to December 31, 2024

Funding Source: NIP/ UP Diliman

Amount: ₱79,200.00

2.2.9 Non-NIP funded projects (7)

Zambale-Simon, Niña Angelica F.

"Structured light: generation, detection and application"

Period: September 01, 2023 to May 31, 2024

Funding Source: UP OVCRD

Amount: ₱60,000.00

Miranda, Jessa Jayne

"Microbubble implosion in structured targets"

Period: September 09, 2024 to September 08, 2025

Funding Source: UP OVCRD

Amount: ₱100,000.00

Emperado, Rommil

"Direct simulation Monte Carlo modelling of laser-produced plasma: expansion, instabilities, and deposition"

Period: September 10, 2024 to September 9, 2025

Funding Source: UP OVCRD

Amount: ₱100,000.00

Dasallas, Lean L.

PhD Incentive award Y2

"Investigating the effects of background gas in the properties of thin film produced by pulsed laser deposition (Y2)

Period: February 05, 2024 to February 04, 2025

Amount: ₱300,000.00

Garcia, Wilson O.

"Computational modelling via direct simulation Monte Carlo method of laser ablation and plasma expansion in relation to the deposited film characteristics on a substrate"

Period: May 02, 2023 to May 01, 2024

Funding Source: DOST PCIEERD

Amount: ₱780,440.00

Hermosa, Nathaniel II P.

"Quantifying Loss of Information with Spatial Mode Projection and Stokes Polarimetry and Blocked Self-healing Optical Beams with Nonfactorable Polarization States and Spatial Mode Components"

Period: October 1, 2024 to September 30, 2026

Funding Source: NRCP

Amount: ₱2,465,463.93

Zosa, Myles Allen H.

"Megatesla magnetic field generation"

Period: April 17, 2023 to April 16, 2025

Funding Source: UP OVPAA

Amount: ₱2,500,000.00

2.2.10 Major equipment acquired (8)

5x High-performance computers (16 cores, 32 GB RAM each)

2x High-performance computers (64 cores, 512 GB RAM each)

1x 0.75 mJ Fiber laser (MFP-30X) (1064 nm)

2.2.11 Research travels abroad (2)

J. Binamira, R. Baybayon and **R. Emperado**

"Summer School on Lasers and Laser Applications 2024 (SSOLLA 2024)"

Advanced Photonics Research Institute, Gwangju Institute of Science & Technology, Gwangju, South Korea.

Period: July 15, 2024 – July 19, 2024

Zosa, Myles Allen H.

Collaborative research visit with Prof. Masakatsu Murakami

Osaka University, Japan

Period: August 3, 2024 – August 17, 2024

2.2.12 Visiting researchers (0)

2.2.13 MOA's entered with local or foreign institutions (0)

2.3 Extension work highlights (1)

Hermosa, Nathaniel II

Speaker

The 10th HugNayan: Space Science Fora

Philippine Space Agency

March 20, 2024

2.3.1 Extension work activities (18)

Almoro, Pervical (2)

- Section Editor of Optik
- Guest Editor, Optical Engineering Special Section: Lensless Imaging in Optical Metrology Optical Engineering, Vol. 63, Issue 11, 111801 (November 2024)

Binamira, Jonel (1)

- Reviewer, 42nd Samahang Pisika ng Pilipinas

Buco, Christian (1)

- Reviewer, 42nd Samahang Pisika ng Pilipinas

Cabanilla, Jayson (1)

- Reviewer, 42nd Samahang Pisika ng Pilipinas

Dasallas, Lean (1)

- Topical Editor 42nd Samahang Pisika ng Pilipinas

De Mata, Joy (1)

- Reviewer, 42nd Samahang Pisika ng Pilipinas

Emperado, Rommil (1)

- Reviewer, 42nd Samahang Pisika ng Pilipinas

Hermosa, Nathaniel II (6)

- 1st Vice President, Samahang Pisika ng Pilipinas
- Reviewer, 42nd Samahang Pisika ng Pilipinas
- Reviewer, Journal of the Optical Society of America A
- Reviewer, Optics & Laser Technology
- Reviewer, Optics Letters
- Reviewer, Optics Communications

Miranda, Jessa Jayne (1)

- Reviewer, 42nd Samahang Pisika ng Pilipinas

Onglao, Mario (1)

- Reviewer, 42nd Samahang Pisika ng Pilipinas

Zambale-Simon, Niña Angelica (1)

- Reviewer, 42nd Samahang Pisika ng Pilipinas

Zosa, Myles Allen (1)

- Reviewer, 42nd Samahang Pisika ng Pilipinas

2.3.2 Research interns/OJT's (6)

Baldonado, Leslie Joy
UNP (University of Northern Philippines)
Date: April 03, 2024 to May 31, 2024 (**480 hours**)
(Adviser: Nathaniel P. Hermosa II, Ph.D.)

Bernados, Franklyn Ortiz
MSU (Mindanao State University) - Marawi
Date: June 18, 2024 to July 31, 2024 (**240 hours**)
(Adviser: Myles Allen H. Zosa, Ph.D.)

Daque, Jhoana Jean Ibabao
MSU (Mindanao State University) - Marawi
Date: June 18, 2024 to July 31, 2024 (**240 hours**)
(Adviser: Nathaniel P. Hermosa II, Ph.D.)

Legaspi, Rafael Yrjosmiel U.
MAPUA University
Date: March 4, 2024 to May 07, 2024 **(240 hours)**
(Adviser: Myles Allen H. Zosa, Ph.D.)

Magtolis, May Ann Sacmar
MSU (Mindanao State University) - Marawi
Date: June 18, 2024 to July 31, 2024 (**240 hours**)
(Adviser: Myles Allen H. Zosa, Ph.D.)

Rangaig, Aina Azis
MSU (Mindanao State University) – Marawi
Date: June 18, 2024 to July 31, 2024 (**240 hours**)
(Adviser: Percival F. Almoro, Ph.D.)

2.3.3 Extension Projects (1)

Hermosa, Nathaniel II

"Establishment of an Optics Teaching Laboratory at the University of the Northern Philippines"

Period: August 1, 2024 to July 31, 2025

Amount: ₱150,000.00

2.4 Main challenges encountered and proposed solutions

Due to the more restrictive overleaf policies involving collaborative editing, we plan on having an overleaf and file server.

2.5 Awards or accreditations received/positions of responsibility held and other accomplishments

2.5.1 Student Awards (6)

Ambrosio, Benjamin Jose C.

Best Thesis

BS Applied Physics

Baybayon, Roel

Best Poster GSRC 2024

Nagal, Danell Jeune

Best Poster GSRC 2024

Manuel, Maria Janelle G.

Most Outstanding M.S. Student

National Institute of Physics

Zambale-Simon, Niña Angelica F.

Most Outstanding Ph.D. Student

College of Science and National Institute of Physics

Zambale-Simon, Niña Angelica F., Mendoza, Maria Isabella, Hermosa, Nathaniel II P.,
Best Poster
Samahang Pisika ng Pilipinas Conference 2024

3 Appendices

3.1 Photos

Photonics Group, NIP UP Diliman, February 26, 2024