



DMMME FOUNDRY

WHERE **IDEAS** BECOME **IMPACT**.



DMMME



FOUNDRY

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MESSAGE FROM THE DMMME CHAIRPERSON

Welcome to the launch of **DMMME FOUNDRY: Where Ideas Become Impact.**

Today, the DMMME community stands at the forefront of research, innovation, and extension. We are united by a common goal: fostering collaborative engagements to turn ideas into tangible solutions for our industry and society.

DMMME FOUNDRY is our dedicated platform to highlight these collaborative efforts. It exists to celebrate our milestone achievements, honor the brilliance of our people, and forge deeper connections with strategic partners.

I extend a heartfelt invitation to our faculty, researchers, students, alumni, and collaborators: make this platform your own. Contribute your work, share your insights, and help us nurture an environment where knowledge moves seamlessly from the lab into the real world.

Let DMMME FOUNDRY serve as a bold reflection of our mission—in our pursuit of academic excellence, our impactful engagements with society and industry, and our continuous commitment to shaping future generations of engineers and scientists.

Thank you, and welcome to DMMME FOUNDRY.

THE DMMME RESEARCH AND EXTENSION PULSE

A snapshot of DMMME's latest research, extension, innovation, and collaboration activities, highlighting publications, new projects, achievements, and opportunities across the Department.

¹Data from 01 January 2026 to 30 September 2026.

²In millions of Philippine pesos.

³All ongoing research and extension projects including the new projects with DMMME as the implementing institution.

25

Publications¹

12

New Research Projects¹

03

New Extension Projects¹

55

Research and Extension Grants Generated^{1,2}

23

Ongoing Research and Extension Projects³



ISSUE HIGHLIGHT

DMMME CONDUCTS 2-DAY STRATEGIC PLANNING WORKSHOP

The Department of Mining, Metallurgical, and Materials Engineering (DMMME) successfully concluded its 2-day Strategic Planning Workshop held on September 7 and 14, 2026, at the UP National Engineering Center. Led by Department Chairperson Dr. Kathrina Lois M. Taaca and facilitated by Ms. Irish Jane L. Talusan (UPD Department of Communication Research), the department's faculty and staff came together for two productive days of collaborative discussions and forward-looking alignment.

Across both sessions, the department's faculty and staff actively tackled key institutional priorities:

- Day 1: Revisited the department's Vision, Mission, and Goals, conducted a comprehensive SWOT Analysis, and mapped out foundational strategic formulations.
- Day 2: Deep-dived into committee strategy alignment, prioritized critical initiatives, and presented actionable implementation roadmaps to guide DMMME's goals in the coming years.

Faculty and staff actively participated and shared their commitment to the department's continued growth and service to the college and university.

RESEARCH SPOTLIGHT

ActHyCoIDD: Activated Hybrid Colloids for Drug Delivery



Project Leader: Kathrina Lois M. Taaca, PhD

Funding: BalikSaliksik Program, DOST PCIEERD

Implementing Unit: Department of Mining, Metallurgical, and Materials Engineering, College of Engineering, University of the Philippines Diliman

Partners: National Institute of Molecular Biology and Biotechnology, College of Science, University of the Philippines Diliman, The Medical City Ortigas

Status: Year of 1 of 1, completed last July 2026

WHY IT MATTERS

Conventional drug delivery systems often cause sharp concentration spikes or sudden drops, risking either toxic side effects or ineffective treatment. Advanced delivery systems solve this by releasing active ingredients in a controlled, multi-stage manner. The collaboration of DMME and TMC have developed an oral colloidal carrier stabilized through plasma-based processing. This colloidal carrier, with acetaminophen as the test drug, provides an immediate initial release for fast relief, followed by a sustained release over several hours in the intestinal environment. By maintaining medicine at steady, non-toxic levels, this approach reduces the risk of accidental overdosing while ensuring long-lasting therapeutic efficacy.



Development of Phantom Model System for Gynecologic and Obstetrics Ultrasound- guided Procedures

WHY IT MATTERS

Ultrasound-guided intervention is a well-established medical procedure, but its safety and accuracy depend heavily on operator skills, while training opportunities remain limited. Phantom models provide a safe and underutilized alternative, but are often prohibitively expensive, have limited ability to replicate characteristics of actual tissues, and are only available overseas. The project developed gel-based material formulations using locally available resources that can mimic the haptic, tactile, and sonoacoustic properties of various reference structures within the abdominopelvic region. Additionally, the team also developed modular phantom model assembly configurations that would allow end-users to modify the arrangement of simulated anatomical structures according to their specific training needs. The resulting phantom system provides doctors with a more accessible and customizable platform for ultrasound-guided procedural training, which can potentially improve their procedural confidence and diagnostic accuracy, ultimately supporting safer and more accurate patient care.

Project Leaders: Dr. Melissa D.L. Amosco, M.D., Ph.D.

& Prof. Leslie Joy L. Diaz, Dr. Eng.

Funding: DOST-PCHRD

Implementing Unit: Institute of Reproductive Health - National Institutes of Health (IRH-NIH), UP Manila

Partners: UP Department of Mining, Metallurgical and Materials Engineering and Ultrasound Division, UP Philippine General Hospital

Status: Year 1 of 1, ongoing implementation until November 2026

RECENTLY PUBLISHED

- 01** [Plasma-Functionalized Copper-Based Organic Framework for Electrochemical Detection of Ciprofloxacin in Aqueous Media.](#)
- 02** Fabrication of an alternative orthopedic cast using Philippine abaca
- 03** Acid Doping of Polyaniline and Wettability of Polyaniline-Chitosan Films

R.M. Nortiza, A.P. Osonio, V.P. Laguardia, M. Hori, G.R. Panghulan, and K.L.M. Taaca, J. Inorg. Organomet. Polym. Mater. 2026

L.O. Cuasay, M. Cayetano, D. Uldo, M.R. Padua, and K.L.M. Taaca. PJSMN. 2026

K.L.M. Taaca, D.V.c Tumacder, M.R.B Abiquibil, R.H Montecillo, T. Mana-ay, R.C. Simon. PJSMN. 2026

RESEARCH IN ACTION

DMMME researchers showcased their latest research and innovations at the recently concluded 6th International Symposium of the Vacuum Society of the Philippines (ISVSP2026) and 19th International Conference on Plasma Science and Applications (ICPSA2026) held at the Batangas State University.

The conference brought together students, researchers, scientists, engineers, and experts from the Philippines and around the world to exchange knowledge and explore new developments in vacuum technology, plasma science, materials engineering, and their applications.

The conference was chaired by Dr. Kathrina Lois M. Taaca, Chairperson of DMMME, representing the Vacuum Society of the Philippines (VSP), and co-chaired by Dr. Magdaleno R. Vasquez Jr., representing the Asian African Association for Plasma Training (AAAPT). This conference was also endorsed by the International Union for Vacuum Science, Technique, and Applications (IUVSTA), American Vacuum Society (AVS), and the Institute of Materials Engineers of the Philippines (IMEP).



DMMME Research and Extension Experts Lecture Series

Two engaging special lectures were held last September 21, 2026 at the DMMME Auditorium, UP Diliman. Prof. Miran Mozetič and Prof. Matjaž Godec shared their expertise and insights to students, faculty, and researchers.

Prof. Mozetič Jozef from the Stefan Institute & Plasmadis Ltd., Slovenia delivered the lecture titled "Plasma Technology for Desired Surface Finish of Solid Materials: How to Upscale Experimental Results to Industrial Reactors." The lecture highlighted the potential of non-equilibrium plasma for surface modification and, importantly, the technological challenges involved in translating laboratory-scale plasma experiments into large-scale industrial reactors.

On the other hand, Prof. Dr. Matjaž Godec from the Institute of Metals and Technology, Slovenia delivered the lecture titled "Additively Manufactured Metals: Microstructure, Properties and Emerging Technologies." His lecture provided valuable insights into the relationship between additive manufacturing processes, microstructure, and material properties, while highlighting emerging developments.

Together, the lectures offered our students, faculty, researchers, and guests an exciting look into two rapidly advancing areas of materials engineering, from plasma-enabled surface engineering to metal additive manufacturing.

IMPACT: BEYOND THE LABORATORY

Showcasing how DMMME research creates impact through training, mentorship, collaboration, extension, and knowledge transfer, bringing expertise and innovation beyond the laboratory to students, communities, industry, and partner institutions.

COLLABORATION CORNER

Towards Establishing a Metals Casting Center

Representatives from DOST-MIRDC, the UP Department of Mechanical Engineering, and the UP Department of Mining, Metallurgical, and Materials Engineering met at the National Engineering Center last September 9, 2026.



The discussion focused on the development pathway for the fruition of a Metals Castings Center under the NEC. The collaboration further focused on capacity building involving casting curriculum development, thesis and research collaborations, and specialized skills development programs. Formalizing the institutional partnership of the parties under the COMPASS Project was also discussed.



Harnessing Life for Sustainable Urban Mining Solutions

A new multidisciplinary initiative has taken flight!

The DMMME Biohydrometallurgy Research Group—headed by Asst. Profs. Bryan Patrick Carrasco, Francesca Valerie Cabanlig, and Aaron Dave Tomas—launched a strategic partnership with Natural Sciences Research Institute - Biological Research and Services Laboratory, through Dr. Pierangeli Vital and Dr. Joy Ann Santos on July 10, 2026.

Ahead of the project's official timeline, the team collected initial bioleaching samples at FCF Minerals Corporation on August 17. The project will focus on identifying and characterizing acidophilic microbial consortia to evaluate their capacity for recovering high-value critical metals from electronic waste, advancing green technology and circular economy efforts in the Philippines.



EXTENSION IN ACTION

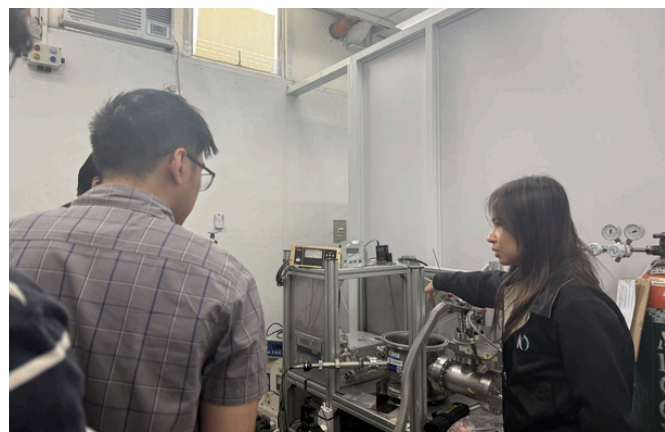


UP Baguio YSIP Grantees Complete Plasma-Material Interactions Training

Recipients of the National Research Council of the Philippines (NRCP) Young Scientists Innovation Program (YSIP) from UP Baguio recently participated in a research training at the Plasma-Material Interactions Laboratory (PMIL) from September 21 to 25, 2026.

Mentored by Prof. Giovanni M. Malapit, the UP Baguio team comprises mentees Romescor C. Apolonio, Angela M. Aquino, Gian Nina M. Garcia, and Christian Rae A. Tabuloc. The team is conducting research in plasma technology, plasma-activated water, atmospheric plasma processing, and advanced materials.

The training was facilitated by Dr. Arantxa Danielle S. Montallana, a DOST Balik Scientist, whose collaboration with UP Baguio, one of her host institutions, has strengthened research linkages and created opportunities for knowledge exchange and capacity building in plasma science and technology and materials processing.



Strengthening Industry-Academe Collaboration with Mako Mining

The UP Department of Mining, Metallurgical, and Materials Engineering met with representatives of Australia-based Mako Mining to discuss opportunities for long-term industry-academe collaboration. The connection is strengthened by UP Mining Engineering alumni currently employed in Mako Mining's Australian operations, where they form part of the company's underground mining engineering team.

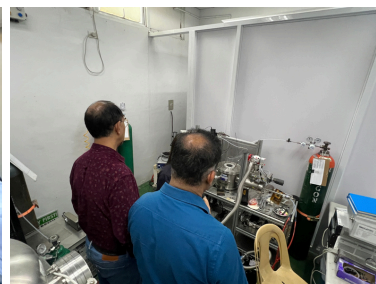
Discussions covered scholarships, undergraduate and faculty research support, international internships in Australia, training programs, and industry-led lectures. Mako Mining expressed interest in supporting multiple scholarships and exploring internship opportunities, with emphasis on practical ability, character, attitude, and academic preparation. Both parties also discussed future engagements involving visiting industry professionals and possible collaboration extending to metallurgy, research, and other academic initiatives.



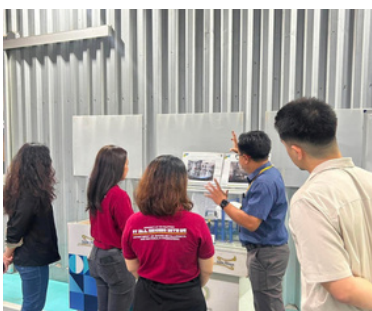
Connecting Globally: International Delegates Visit DMMME

DMMME recently welcomed international delegates of the 6th International Symposium of the Vacuum Society of the Philippines/19th International Conference of Plasma Science and Application (ISVSPxICPSA 2026) last September 15, 2026. This was an insightful visit and opportunity for the department to showcase its capacity and highlight various facilities. Exchange of ideas also happened where both the department and delegates shared ideas and strategies to continue and foster the engagement.

The delegates comprised of experts from Nagoya University (Japan), Kyushu University (Japan), ULVAC Inc (Japan), James Cook University (Australia), Nanyang Technological University (Singapore), and the National Research and Innovation Agency (BRIN, Indonesia).



EXTENSION IN ACTION



DMMME Researchers Visit SLRI in Thailand

Purpose: Beamline Experiment at the Synchrotron Light Research Institute

Areas: Materials Science, Surface Science, Spectroscopy

Opportunities: Joint research work and continued engagement with SLRI as a partner institution of DMMME. This also became an opportunity with students and staff to get to know synchrotron facilities and how techniques are being used.



THESIS FORGE

RECENTLY DEFENDED	ADVISER	PROGRAM
Jehiel Lyre Malan , Effect of Salt and Chitosan Incorporation in Alginate-Carrageenan Films for Packaging Applications	Asst. Prof. Tiffany Louise Lao	BS MatE
Azmarie Alonto , Plasticizer Enhancement of Gelatin-Tannic Acid (Gel-TA) Hydrogels as Self-Healing Tissue Mimicking Material (TMM) for Surgical Simulation Performance	Dr. Leslie Joy Diaz Engr. Nerissa Unielle Quenga	BS MatE

RECOGNITION CORNER

DMMME congratulates the following faculty and staff for their invaluable contribution to science and engineering!



PROF. DJOAN KATE TUNGPALAN, PhD

Inspiring Filipina Engineer Award
20th International Conference of Women Engineers and Scientist (ICWES 20) and 10th Philippine Women Engineers and Scientists Summit (PWESS 10)

PROF. MARY DONNABELLE BALELA, PhD

2026 David M. Consunji Award for Engineering Research
75th Philippine Association for the Advancement of Science, Technology and Innovation (PhilaASTI) Annual Convention



AURELIA MECHILINA

Best Presenter
"Effect of Annealing on the NiTiCu Films Deposited via Magnetron Sputtering using NiTi, Ti, and Cu Targets"
6th International Symposium of the Vacuum Society of the Philippines (ISVSP 2026) and the 19th International Conference on Plasma Science and Applications (ICPSA 2026)

WHAT'S NEXT?

FUNDING OPPORTUNITIES

Office of the Vice Chancellor for Research and Development (OVCRD)

Outright Research Grant (ORG) and Open Grant (OG)

Deadline: November 10, 2026, 5:00PM

UPCOMING CONFERENCE



CALL FOR CONTRIBUTIONS TO THE DMMME FOUNDRY

Published a paper?

Started a project?

Won a grant?

Developed a technology? Defended a thesis?

Established a partnership? Conducted an extension activity?

Submit to REC and let the DMMME community know.

Email us at dmmme-rec.upd@up.edu.ph

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CONTRIBUTORS

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A newsletter prepared by the DMMME Research and Extension Committee