OBAFEMI AWOLOWO UNIVERSITY
PHYSICS AND ENGINEERING PHYSICS

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# The Nucleus

NEWSLETTER OF THE DEPARTMENT OF PHYSICS AND ENGINEERING PHYSICS

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# Letter From The Editor



**Dear Colleagues, Students, Alumni, and Friends,**

It is my distinct pleasure to present to you the maiden edition of the Department of Physics and Engineering Physics Newsletter.

Through this publication, we aim to showcase our achievements, celebrate our progress despite our unique challenges, and share our academic, research, and community engagements. It is our sincere hope that it will strengthen communication and foster ties among our students, staff, alumni, and friends.

In this edition, we feature Professor O. O. Jegede's insightful reflection on his five decades in the Department. We also share news of appointments and retirements, highlight departmental outreach, and honour the memory of colleagues who have recently passed on.

I sincerely appreciate the Editorial Committee and everyone whose dedication and hard work have made this maiden edition possible.

I encourage everyone to actively contribute to the newsletter. I wish you an inspiring and enjoyable read.

With warm regards,
**Professor Olumide Akinwunmi**
Editor-in-Chief

# Head of Department's Reflections



Established in 1962 within the Faculty of Science, Obafemi Awolowo University, the Department has long served as a cornerstone of Great Ife's intellectual tradition, advancing physics as both a fundamental science and a driver of innovation. From its early years, the Department fostered a culture of academic excellence, global engagement, and intellectual rigour, attracting internationally renowned scholars and producing graduates who have gone on to shape academia, industry, and public life.

Its evolution to include Engineering Physics in the 1970s demonstrated foresight, positioning the Department at the intersection of science and technology. Despite periods of significant challenges, including resource constraints and infrastructural decline, the Department has remained resilient, sustained by dedicated staff and strengthened through international collaborations with organisations such as the International Atomic Energy Agency and the Abdus Salam International Centre for Theoretical Physics.

Looking ahead, the Department is committed to renewing its research excellence, modernising its laboratories, and investing in human capital. With a clear focus on both established strengths and emerging fields, it aims to reassert its position as a globally competitive centre for scientific research and innovation.

We call on alumni, students, and staff to play active roles in this next phase of growth, emphasising that while the legacy of excellence defines the past, a shared commitment to innovation and collaboration will shape the future.

**Professor Felix S. Olise**
Head of Department

# Goodwill message from the Deputy Vice Chancellor (Academics)

It is with great pleasure and a profound sense of pride that I congratulate the Head of Department, members of staff, students, alumni, and friends of the Department of Physics and Engineering Physics on the publication of the maiden edition of the Department's Newsletter.

The establishment of this Newsletter is a commendable and timely initiative. Beyond serving as a record of the Department's activities, it provides a valuable platform for showcasing its academic and research achievements, celebrating the accomplishments of its staff and students, highlighting innovations and impactful engagements, strengthening relationships with alumni and other stakeholders, and documenting the Department's growth, aspirations, and contributions to society.

Physics remains fundamental to our understanding of the natural world and continues to underpin advances in science and technology. Engineering Physics, by bridging fundamental scientific knowledge with technological applications, plays an equally important role in addressing contemporary developmental challenges. The Department therefore occupies a strategic position in advancing the University's commitment to excellence in teaching, cutting-edge research, innovation, entrepreneurship, and community service. Its graduates, researchers, and academic staff have continued to make significant contributions to national development and to the global scientific and technological community.

I therefore encourage members of staff, students, alumni, and friends of the Department to embrace this Newsletter as a shared platform for communication, engagement, and institutional development. I urge them to contribute their research findings, innovations, professional accomplishments, success stories, and experiences, while also supporting initiatives that will further strengthen the Department's academic standing, research capacity, infrastructure, and global visibility.

I commend the Head of Department, the Editorial Committee, contributors, and all those who have worked diligently to make this maiden edition a reality. I am confident that the Newsletter will grow into a respected and enduring platform for knowledge sharing, institutional memory, and stakeholder engagement.

Once again, I extend my warm congratulations to the entire Department of Physics and Engineering Physics on this important milestone. I wish the Newsletter sustained publication, wide readership, and enduring impact, and I look forward to many more editions that will reflect the Department's continuing journey of excellence, innovation, and service.

**Professor G. A. Aderounmu**
Deputy Vice Chancellor (Academics)

# Goodwill message from the Director Center for Energy Research and Development

The Centre for Energy Research and Development warmly extends its heartfelt goodwill to the Department of Physics and Engineering Physics, Obafemi Awolowo University, Ile-Ife. Born as an offshoot of your Department in 1980, the Centre carries with it a legacy of academic excellence, curiosity, and a shared commitment to advancing science, particularly in the nuclear sector, for societal benefit.

We celebrate the Department's continued dedication to teaching, research, and mentorship that has shaped generations of physicists and engineers. Your achievements inspire our work in energy research and strengthen the bond between our units; together we have advanced knowledge, trained leaders, and contributed to national development.

As colleagues and collaborators, we reaffirm our readiness to support joint research, student training, and community outreach initiatives. May the Department continue to flourish in scholarship, innovation, and service, and may our partnership grow ever stronger in the years ahead.

With warm regards,

**Professor Abiodun S. Momodu**
Director, Center for Energy Research
and Development

FEATURED ARTICLE

# Five Decades of Excellence in Physics at Great Ife

## A MEMOIR



**Professor Oluwagbemiga O. Jegede**
Professor of Atmospheric Physics

My first association with the University dates to September 1977. Then it was known as University of Ife, and we happen to be the last set of students admitted through the concessionary mode of examination. I was enrolled in the B.Sc. (Hons.) degree programme in Engineering Physics, as part of the third cohort of students. My student registration number was 771344. The University popularly referred to as Great Ife! was renamed Obafemi Awolowo University (OAU) in 1987 in honour of the distinguished Nigerian statesman.

The Department of Physics (DoP) began in 1962 as part of the foundational programmes in the Faculty of Science.

The DoP evolved, offering courses in pure and applied physics, spawning off the Department of Electrical and Electronic Engineering in 1971, and later introducing the Engineering Physics programme (nuclear engineering and materials science options) in 1975. The DoP has experienced remarkable growth - truly reminiscent of the biblical mustard seed. Physics was widely regarded as the bedrock for national development. Then, we often were confronted with questions such as: “When are you people going to build nuclear bombs to counter South Africa?” Such sentiments reflected the high expectations placed on the discipline. The present nomenclature, Department of Physics and Engineering Physics (DPEP), was approved in the 2014/2015 session.

My entry into the department exposed me to the vibrant and intellectually stimulating culture that defined the Great Ife! at the time. In my view, the period 1975 - 1985 stands out as the golden decade. As an undergraduate, I experienced a rich blend of academic rigours and dynamic extracurricular engagement - ranging from activism to socio-cultural activities - within a thriving intellectual environment. As I settled into the academic programme, I was later influenced to transfer to the pure physics option, a decision that eventually reshaped my academic trajectory.

**"As at the present time, the department has trained over 150 MSc and 80 MPhil/PhD students."**



Professor Jegede is pictured in the right frame with members of his research group.

Lectures, tutorials, practical sessions, and assignments were intensive and offered throughout the week, effectively creating a seven-day academic schedule. The university calendar ran with remarkable precision, with minimal disruptions to lectures or examinations. For a conscientious student, distractions were virtually nonexistent. The support systems were quite robust: student loans, federal and state bursaries, affordable students hostel accommodation, efficient cafeteria services, and campus butteries (pantries) ensured students could focus properly on their studies. Basic amenities such as water and electricity were reliable - an enviable standard by any measure.

The calibre of academic staff employed in the department was truly international. Diversity of high-quality lecturers enriched our academic experience, challenged our intellect, and inspired excellence. Undergraduate students were taught with appreciation for the maxim: "only the best is good enough". Up to the mid-1980s, all the undergraduate teaching laboratories, viz; Parts I, II and III were well equipped with requisite apparatus for scheduled experiments. The students number ratio was appropriately matched for the available facilities used for demonstrations and practicals. The laboratory staff were challenged and quite helpful. Faulty instruments were promptly replaced.

In terms of research infrastructure, the department was well-equipped. Facilities available then included an X-ray diffractometer, scanning electron microscope, Mössbauer spectroscopy, Carbon-14 dating laboratory, optical pumping, and photoluminescence. These resources enabled cutting-edge research by staff and positioned the department at the forefront of scientific inquiry at that time.

Availability of facilities attracted many postgraduate students to the department. A good number of second-generation members of staff were employed as graduate assistants and initial enrollees for the postgraduate degree programmes (MSc, MPhil., PhD). The first PhD (Physics) degree in the department was awarded in 1987. Encouragingly, the first generation of Department of Physics graduates who went overseas for postgraduate studies all returned by the late 1970s to strengthen teaching capacity in the department.

This effort continued until the middle eighties when some staff of the department on approved leave stopped coming back from the overseas training. As at the present time, the department has trained over 150 MSc and 80 MPhil/PhD students.

Physics at OAU have gained the national prominence. Our lecturers are well respected and held in very high esteem. The department had hosted Nigerian Institute of Physics (NIP) conferences twice, in 1990 and 2005, and another by CERD, OAU in 2015. Several senior staff members have been conferred fellowship of NIP, thus enhancing the department's visibility nationally. The alumni also excelled globally, contributing significantly to academia and the industry.

However, from around 1979 - during our second or third year - obvious cracks began to appear as government subventions increasingly fell short of the funding required to sustain the university. From the early 1980s, the department experienced a significant exodus of academic staff, particularly the expatriates. The department struggled to maintain and replace obsolete equipment, leading to reduced research output and diminished global competitiveness. From the 1990s onwards, research conducted by staff depended heavily

on external fundings and international collaborations. Some research laboratories became rundown, the lecture theatres dilapidated, and essential facilities fell into disrepair.

Headships of the department right from onset has remained in the hands of wholly indigenous (Nigerian) occupants. From the pioneering days of Professor D. F. Ojo in 1962 to the current appointment of Professor F. S. Olise in August 2025, eighteen (18) senior members of staff have occupied the office as substantive/acting heads of department over the past 60 years of existence. Currently the department boasts of 17 professors and readers and more than 13 in the lectureship/senior lectureship cadre. Areas of expertise are wide: theoretical physics, nuclear physics, solid state physics, atmospheric physics, geophysics, environmental and health physics, medical physics, and materials science.

## Conclusion: legacy, lessons and path forward

As I reflect on my five decades of physics at Great Ife!, what stands out most is not merely the passage of time, but the enduring legacy of excellence, resilience, and intellectual distinction that has defined the department. From its formative years of abundant resources and global relevance to the periods of constraint and adaptation, the Department of Physics and Engineering Physics has remained a crucible for the development of scientific thought and leadership. Generations of students have passed through its halls, shaped not only by rigorous academic training but also by a culture that demanded curiosity, discipline, and excellence. Many of these alumni now occupy positions of influence across academia, industry and public service both within Nigeria and internationally.



Wakefield, UK, 1998

In my modest opinion, the golden era of this university (that is, 1975 - 1985) demonstrated what is possible when adequate funding, strong institutional vision, and high-quality personnel converge. Human capital remains the department's greatest asset. Even in times of limited resources, the commitment of staff and the determination of students have sustained its relevance. Looking ahead, there is a compelling need for renewed commitment and strategic revitalisation.

This includes the rehabilitation of infrastructure, modernisation of laboratories, expansion of physical space, and the attraction and retention of top-tier academic talent. Strengthening partnerships with international institutions, alumni, industry, and funding agencies will also be crucial in restoring the department to its rightful place at the forefront of scientific research and innovation.

While the challenges of recent decades are undeniable, they do not define the department. Rather, it is the legacy of excellence, the wealth of human capital, and the enduring spirit of Great Ife! that define it. Great Ife! lives on - not only in memory, but in promise.

As it can be imagined, many of the foundation staff have sadly passed away. Their contributions to growth of the department can never be forgotten. May their souls rest in peace, Amen. Hence, this write up is dedicated to their individual and collective memories.

**Professor O. O. Jegede** (Physics Alumnus, 1981 set)
Department of Physics and Engineering Physics
Obafemi Awolowo University,
Ile-Ife, Nigeria
April 2026



A younger Jegede during his tenure as an ISP Fellow in the Department of Meteorology at Uppsala University, Sweden, December 1989.

# Featured Research

## Defect engineering with group III dopants in 2D monolayer SiC for improved electronic devices

Emmanuel Igumbor, Patience Ajeh, Edwin Mapasha, Ezekiel Omotoso, Abdulrafiu Raji

Hybrid density functional theory was used to study group III dopants (B, Al, Ga, In, and Tl) in two-dimensional monolayer silicon carbide. Boron is the most energetically favorable dopant, while thallium is the least favorable. Boron can reach high concentrations at low temperature, whereas thallium remains negligible up to very high temperatures. Gallium shows limited concentration near room temperature but becomes technologi-cally relevant at elevated temperatures. Dopants on carbon sites generally create mid-gap states, magnetic moments, and spin asymmetry. In contrast, dopants on silicon sites avoid mid-gap states and produce non-magnetic p-type behavior useful for high-temperature nanoelectronic devices.

**DOI: 10.1016/J.MSSP.2026.110465**

Read more

## Characterization and standardi-zation of the AFO continuous ambient air quality monitoring station, Lagos, Nigeria

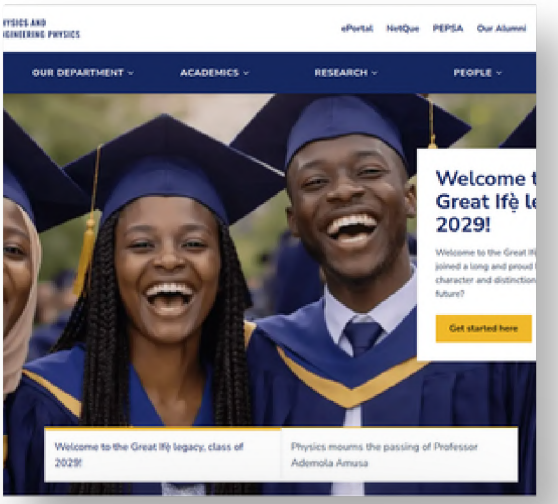
Oluwole, A. F., Asubiojo, O. I., Pelemo, D. A., Taiwo, T. A., Osasona, O., Fasuyan, A., Joshua, O., Ojo, J. O., Ayoola, M. A., Akinlade, G. O., Matthew, O. J., Okoya, A. A., Sylvester, J. O., Adeniyi, A. A. and Aduwo, A. I.

The newly commissioned Abiodun Francis Oluwole (AFO) Continuous Ambient Air Quality Monitoring Station at Igbobi, Lagos, revives Nigeria's pioneering 1992 air-quality station after three decades of abandonment. Built on a more sustainable and low-cost model, the station uses a customized ZATA sensor platform to measure particulate matter, gases, and meteorological parameters with high resolution. Data are transmitted in real time through LTE and related interfaces. Calibration with standard active and passive samplers showed excellent agreement, with $r^2$ values from 0.990 to above 0.999. The station now provides continuous reference data for air-quality and meteorological studies in Nigeria.

**DOI: 10.4314/IJS.V28I1.11**

Read more

# Departmental News




## DEPARTMENTAL WEBSITE LAUNCHED

The Department has officially re-launched its website as part of efforts to improve communication, digitial visibility, and stronger engagement with its students, esteemed alumni, staff, collaborators and the wider public. The upgraded platform provides a cleaner interface, improved navigation, and easier access to departmental news, academic programmes, staff profiles, research activities, publications, events, and other resources. The departmental website can be accessed at https://physics.oauife.edu.ng.



## DR. O. FASAKIN APPOINTED READER

Dr. Fasakin holds a Ph.D. in Engineering Physics (Materials Science) from Obafemi Awolowo University, Ile-Ife. His research covers thin-film development for optoelectronics, activated carbon from agricultural waste, and metal-oxide nanomaterials for energy storage, especially supercapacitors and lithium-ion batteries. His work combines the synthesis, materials characterization, and electrochemical testing to advance commercialized sustainable, high-performance energy storage technologies. He is well published in reputable peer-reviewed journals, with over 1000 citations, and h-index of 19.



## DR. D. D. MAZA APPOINTED READER

Dr. Maza holds a B.Sc., M.Sc., and Ph.D. in Engineering Physics from Obafemi Awolowo University, with expertise spanning radiation and health physics, bio-kinetic modeling, environmental risk assessment, and predictive machine learning in health diagnostics. He teaches courses in nuclear and particle physics, quantum physics, and modern physics, and superviseds undergraduate and postgraduate students. Dr. Maza is well published, contributing pioneering work on physiologically-based biokinetic models for toxic trace elements and computational approaches to disease prediction.

## ACADEMIC STAFF PROMOTIONS

| | | |
|---|---|---|
| MR. A. P. ADESOPE | LECTURER II | GEOPHYSICS |

## NON-ACADEMIC STAFF PROMOTIONS

| | |
|---|---|
| MR. L. O. DAIRO | CHIEF TECHNOLOGIST |
| MRS. B. N. OLISE | CHIEF TECHNOLOGIST |
| MR. A. A. ODUBADE | TECHNOLOGIST II |
| MR. E. O. OYETUNJI | SENIOR WORKSHOP SUPERVISOR I |

# In Memoriam



## PROF. M. K. FASASI PASSES ON

The Department mourns the passing of Professor M. K. Fasasi, a respected academic whose career contributed significantly to radiation measurement, nuclear reactor modelling, radiological assessment, and radiation-shielding materials. Beyond his publications and academic service, Professor Fasasi is remembered as a teacher, mentor, and community-minded scholar whose influence extended to students, colleagues, and many others who benefited from his guidance and example. We extend heartfelt condolences to his family, colleagues, former students, and associates.



## PROF. ADE AMUSA TRANSITIONS

The Department announces the transition of Professor Ademola “Adé” Amusa, a distinguished nuclear physicist and former Head of Department from 1989 to 1992. His research contributions covered areas such as Mössbauer spectroscopy, Hartree-Fock calculations, nuclear shell-model studies, and two-nucleon transfer reactions. Beyond scholarship, Professor Amusa contributed significantly to physics education and professional development in Nigeria. We remember him as a scholar of integrity, intellectual rigour, and generous mentorship whose legacy lives on through his students.

# Outreach

A panorama from visits to elders who helped shape the Great Ife Physics legacy.

Visitation to Prof. E. O. B. Ajayi who clocked 82 years old on March 23.





Visitation to Emeritus Prof. J. B. Aladekomo one of the department's founding fathers in Ibadan where he re-affirmed his committment to supporting the department's research and academic activities.







In what would later prove to be a deeply providential visit, the Department visited Professor Ademola Amusa. Sadly, he passed on shortly afterwards. We remain deeply grateful for the opportunity to honour him, sit with him, and share in those precious final weeks.



Visitation to the family of Elder Timothy F. Famuyiwa (Retired, 2004)

Professor H. B. Olaniyi was also among the distinguished elders visited during the outreach.



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**Would you like to contribute to our Newsletter or do you have information that can help us improve our publications? Please get in touch at aolabode@oauife.ed.ng**

Editorial Committee / 2026 -




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