

PHYSICIST · MATERIALS & ENERGY RESEARCHER

Yendoubé Laré, Ph.D.

Full Professor of Physics

Department of Physics · Université de Lomé

Materials science and sustainable energy : photovoltaics, thin films, and the systems that turn research into reliable power.

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Lomé, Togo



41

peer-reviewed publications

36

graduate students supervised

6

doctoral candidates in progress

15+

years of university teaching

About

Yendoubé Laré is a full professor of physics at the Université de Lomé, where his research centres on sustainable energy technologies and materials science : the development and characterization of materials and systems for renewable energy, particularly photovoltaics and energy storage.

He leads work in nanoelectronics and optoelectronics, with an emphasis on thin films and their role in improving solar-cell efficiency. He chairs both the UNESCO Chair on Renewable Energies and the Master's Programme in Materials at the Université de Lomé.

His work spans the fundamental physics of materials to applied energy systems, exploring how nanotechnologies can make energy infrastructure more efficient and less dependent on non-renewable resources. Beyond the university, he advises on sustainable-energy policy across Togo and the wider region, and mentors the doctoral and master's researchers who will carry this work forward.

Education

2009–2010	Postdoctoral Researcher University of Nantes, France Organic solar materials
2006–2009	Ph.D. in Physics Université de Lomé Thin films · Optoelectronics
2004–2006	M.Sc. in Physics Université de Lomé Materials & energy
1999–2004	B.Sc. in Physics Université de Lomé Industrial physics & energy systems

Professional history

Since 2022	Full Professor of Physics Université de Lomé
2016–2022	Associate Professor of Physics Université de Lomé, Togo
2011–2016	Assistant Professor of Physics Université de Lomé, Togo
Since 2023	Chair, UNESCO Chair on Renewable Energies Université de Lomé
Since 2021	Chair, Master's Programme in Materials Université de Lomé
Since 2010	Project Manager, Solar Energy Laboratory Université de Lomé
Since 2017	Secretary-General, Togolese Physics Society Université de Lomé
Since 2017	Vice-Chair, University Services Centre Université de Lomé
2007	Founder, SOS Energy Togo Association Togo
COURTESY APPOINTMENTS	
Since 2012	Adjunct Professor, School of Computer Science (CIC) Université de Lomé
Since 2010	Adjunct Professor, School of Medicine Université de Lomé
Since 2010	Adjunct Professor, ESTBA Université de Lomé
Since 2020	Adjunct Professor, École Polytechnique de Lomé Université de Lomé

Since 2019	Adjunct Professor, CERME Université de Lomé
Since 2014	Adjunct Professor, WASCAL Regional institution
Since 2016	Adjunct Professor, Department of Physics Université de Kara
VISITING RESEARCH	
Apr–Nov 2014	Visiting Researcher, Institute of Applied Physics TU Dresden, Germany
Aug–Nov 2013	Visiting Researcher Indian Institute of Technology, Calicut, India

Research areas & expertise

- Nanoelectronics

Nanofabrication

Nanophotonics

Nonlinear optics

Optical materials
- Optoelectronics

Photonics

Thin films for photovoltaics

Characterization & synthesis
- Energy infrastructure security

Energy & sustainability

Energy storage

Artificial intelligence
- Smart cities & IoT

Publications

41 peer-reviewed works

- K. M. Segbefia, K. Wala, W. Atakpama, N. M. Bawana, F. Folega, K. Akpagana. "Comparaison de la performance de deux types de foyers améliorés traditionnels : foyer à argile du Togo et foyer malgache." Journal de la Recherche Scientifique de l'Université de Lomé, 2018.
- A. K. Apelete, Y. Laré, K. Sagna, N. M. Bawana. "Study and modeling of the operation of a solar water heater in Togo." International Journal of Advanced Research, 2018.
- L. Cattin, F. Dahou, Y. Laré, et al. "MoO₃ surface passivation of the transparent anode in organic solar cells ultra-thin films." Journal of Applied Physics, 2009.
- Y. Laré, A. Godoy, L. Cattin, et al. "ZnO thin films fabricated by chemical bath deposition used as buffer layer in organic solar cells." Applied Surface Science, 2009.
- Y. Laré, M. Baneto, L. Cattin, et al. "Effect of a zinc oxide buffer layer at the cathode interface on the efficiency of inverted organic photovoltaic cells." Journal of Materials Science: Materials in Electronics, 2010.
- M. Baneto, Y. Laré, L. Cattin, et al. "Comparison of the structural and morphological properties of Sn-doped ZnO films deposited by spray pyrolysis and chemical bath deposition." Asian Journal of Materials Science, 2010.
- M. Baneto, Y. Laré, et al. "Étude de l'effet des bases ammoniacque, potasse et soude sur la morphologie et la résistivité électrique des couches minces de ZnO:Al élaborées par dépôt en bain chimique." Revue Ivoirienne des Sciences et Technologies, 2010.
- M. Gacitua, Y. Boutaleb, L. Cattin, Y. Laré, et al. "Electrochemical preparation of MoO₃ buffer layer deposited onto the anode in organic solar cells." Physica Status Solidi A, 2010.
- K. Tepe, Y. Laré, G. Djeteli, et al. "Caractérisation des cellules photovoltaïques à l'aide d'un dispositif optique." Revue Ivoirienne des Sciences et Technologies, 2009.
- A. S. Yapi, L. Toumi, Y. Laré, et al. "On the influence of the exciton-blocking layer on the organic multilayer cells properties." European Physical Journal : Applied Physics, 2010.
- Y. Laré, B. Kouskoussa, K. Benchouk, et al. "Influence of the exciton blocking layer on the stability of layered organic solar cells." Journal of Physics and Chemistry of Solids, 2011.
- Y. Mouchaal, A. Lakhdar Toumi, A. S. Yapi, Y. Laré, et al. "Optical and electronic properties of thin films based on (Z)-5-(4-chlorobenzylidene)-3-(2-ethoxyphenyl)-2-thioxothiazolidin-4-one (CBBTZ) and possible application as exciton

blocking layer in heterojunction organic solar cells." EPJ Web of Conferences, 2012.

13	M. Makha, L. Cattin, Y. Laré, et al. "MoO ₃ /Ag/MoO ₃ anode in organic photovoltaic cells: influence of a CuI buffer layer between the anode and the electron donor." Applied Physics Letters, 2012.
14	L. Cattin, J.-C. Bernède, Y. Laré, et al. "Improved performance of organic solar cells by growth optimization of MoO ₃ /CuI double anode buffer." Physica Status Solidi A, 2013.
15	L. Cattin, Y. Laré, M. Makha, et al. "Effect of the Ag deposition rate on the properties of conductive transparent MoO ₃ /Ag/MoO ₃ multilayers." Solar Energy Materials & Solar Cells, 2013.
16	T. Abachi, L. Cattin, G. Louarn, Y. Laré, et al. "Highly flexible, conductive and transparent MoO ₃ /Ag/MoO ₃ multilayer electrode for organic photovoltaic cells." Thin Solid Films, 2013.
17	J.-C. Bernède, L. Cattin, T. Abachi, Y. Laré, et al. "Use of CuAg bi-layer films in oxide/metal/oxide transparent electrodes to widen their spectra of transmittance." Materials Letters, 2013.
18	M. Baneto, A. Enesca, Y. Laré, et al. "Effect of precursor concentration on structural, morphological and opto-electric properties of ZnO thin films prepared by spray pyrolysis." Ceramics International, 2014.
19	K. N'Konou, Y. Laré, et al. "Influence of barium doping on physical properties of zinc oxide thin films synthesized by the SILAR deposition technique." Advances in Materials, 2014.
20	M. Baneto, A. Enesca, C. Mihoreanu, Y. Laré, et al. "Effects of the growth temperature on the properties of spray-deposited CuInS ₂ thin films for photovoltaic applications." Ceramics International, 2015.
21	K. N'Konou, M. Haris, Y. Laré, et al. "Effect of barium doping on structural and optical properties of zinc oxide nanoparticles synthesized by the microwave hydrothermal method." Physica Status Solidi B, 2015.
22	K. N'Konou, M. Haris, Y. Laré, et al. "Effect of barium doping on the physical properties of zinc oxide nanoparticles elaborated via the sonochemical synthesis method." Pramana : Journal of Physics, 2016.
23	K. Kety, A. K. Amou, K. Sagna, Y. Laré, et al. "Simulation and prediction of the power output and the photocurrent for photovoltaic systems." American Journal of Energy Research, 2017.
24	K. A. Amou, K. Sagna, Y. Laré, et al. "Modeling of the solar potential of Lomé, Atakpamé and Mango from weather data in Togo." Renewable Energy Research, 2017.
25	M. S. P. Kitegi, Y. Laré, et al. "Potential for green hydrogen production from biomass, solar and wind in Togo." Smart Grid and Renewable Energy, 2022.
26	Y. Laré, K. Sagna, et al. "Simulation of the power-flow state of the main electrical distribution grid of Abomey-Calavi and Lomé-Golfe." Science Journal of Energy Engineering, 2021.
27	K. Amega, Y. Moumouni, Y. Laré. "A system-dynamics modelling of long-term residential electricity consumption in Lomé, Togo." International Journal of Energy and Power Engineering, 2021.
28	Y. Laré, K. Sambiani, et al. "Modeling of the global daily horizontal solar radiation data over Togo." Energy and Power Engineering, 2021.
29	M. Kabe, Y. Laré, et al. "Simulations of heterojunction and tandem solar cells based on 3C silicon carbide." Journal of Applied Mathematics and Physics, 2020.
30	A.-B. Tchakpedeou, Y. Laré, et al. "An improved Levenberg–Marquardt approach with a new reduced form for the identification of parameters of the one-diode photovoltaic model." Journal of Solar Energy Engineering, 2022.
31	K. Amega, Y. Laré, et al. "Energy-efficiency impact on urban residential electricity consumption and carbon-dioxide reduction: a case study of Lomé, Togo." Energy Efficiency, 2022.
32	K. Amega, Y. Laré, et al. "Development of a typical meteorological year for massive renewable-energy deployment in Togo." International Journal of Sustainable Energy, 2022.
33	K. Amega, Y. Laré, et al. "Solar-energy-powered decentralized smart grid for sustainable energy supply in low-income countries: analysis considering climate-change influences in Togo." Energies, 2022.
34	G. Apedanou, K. N'wuitcha, Y. Laré, K. Napo. "Numerical study of mixed convection in an isosceles trapezoidal cavity with several outlets: application for primary air draft in the ASUTO charcoal stove." Modern Mechanical Engineering, 12, 45–61, 2022.
35	G. K. Apédanou, K. N'wuitcha, Y. Laré, K. Napo. "Numerical study of natural solutal convection in an isosceles trapezoidal cavity." Asian Journal of Physical and Chemical Sciences, 10(4), 2022.

36	Z. Boubakar, N. Williams, B. A. A. Diallo, Y. Laré. "Geo-temporal analysis of electricity-consumption growth in Togo." 2022 IEEE PES/IAS PowerAfrica, 2022.
37	M. S. P. Kitegi, Y. Laré, C. Ousmane. "Potential for green hydrogen production from biomass, solar and wind in Togo." International Journal of Renewable Energy Development, 2022.
38	Y. Laré, K. Sagna, K. S. Apeke, D. K. Afodanyi, A. S. d'Almeida. "Study of the thermodynamic properties of a drop in an environment under subcritical conditions during evaporation." International Journal of Physics, 11(3), 97–105, 2023.
39	K. N'wuitcha, G. K. Apedanou, Y. Laré, K. Napo. "Modeling of coupled heat and mass transfer in a trapezoidal porous bed on a grid." Open Journal of Fluid Dynamics, 13, 1–15, 2023.
40	D. K. Afodanyi, K. Sagna, H. Guengane, Y. Laré. "Feasibility study for the construction of a thermodynamic solar power plant in Togo." Sustainable Energy, 11(1), 1–11, 2023.
41	K. Sambiani, Y. Laré, et al. "Location-allocation combining fuzzy analytical hierarchy process for waste-to-energy facility siting in developing urban areas: the case of Lomé, Togo." Heliyon, 2023.

Projects & public service

2009–Present Togo	Local stoves characterization Role · Energy-component consultant : cooking-technology testing (WBT, CCT, KPT) for carbon-finance projects with SOS Energy Togo Sponsor · E+Carbon, Ecosur Afrique, Man & Man, Entrepreneurs du Monde, Mivo Energie, Sequoia Plantation, Africa4Climate, Accessible Energie, Toyola Energy SARL
2023 Togo	Action Plan for Access to Sustainable Energy & Climate (PAAEDC), Lakes 1 Municipality, 2024–2034 Role · Consultant Sponsor · European Union / Lacs 1 Municipality
2022 Togo	Solar sizing & planning study, communes of Tchaoudjo 1–4 (domestic solar kits) Role · Consultant Sponsor · Expertise France / Communes of Tchaoudjo
2021 Togo	Evaluation of Phase 1 of the PROENERGIE project (2017–2020) Role · Consultant Sponsor · GIZ, Germany
2019 Togo	Study on the energy consumption of public and commercial services in Togo Role · Consultant Sponsor · Ministry of Mines and Energy of Togo
2019 Togo	Feasibility study for renewable-energy development in Togo Role · Solar & wind energy consultant Sponsor · WASCAL Togo (German Federal Ministry of Education and Research)
2019 Togo	Creation of regional solar academies (CIZO project) : training of trainers & technicians Role · Consultant Sponsor · AT2ER Togo
2017 Togo	Review of Togo's energy policy Role · Representative of the Université de Lomé : renewable-energy component lead Sponsor · Ministry of Mines and Energy of Togo
2015 Burkina Faso	Training of technicians in stove testing, surveys and identification Role · Consultant Sponsor · SNV, Netherlands

2023 Ivory Coast	Renovated Partnership for Research at the Ivory Coast Development Service (PRESED-CI) Role · Research-team member : energy component Sponsor · French Republic / IRD / State of Ivory Coast
2013–2015 Togo	National action plans for renewable energy (PANER), energy efficiency (PANEE) and SE4ALL Role · Consultant Sponsor · Ministry of Mines and Energy of Togo
2008–2010 Togo	UEMOA Regional Biomass-Energy Programme : improved-stove capacity building & census Role · Consultant Sponsor · Ministry of Mines and Energy of Togo

Students supervised

7 doctoral · 3 completed Ph.D. · 26 M.Sc.

CURRENT PH.D. STUDENTS

SAMBIANI Kanlanféi	Since 2021
Thesis · Investigating the efficient use of urban waste for energy production in West Africa: a case study of Togo.	
KABE Moyème	Since 2021
Thesis · Modèles de réseaux électriques optimisés et résilients pour le Togo, à court et long termes : intégration des ressources énergétiques distribuées et des mesures d'efficacité énergétique.	
SANI Lawan	Since 2022
Thesis · Étude comparative des performances de modules photovoltaïques de différentes technologies en climat sahélien : quelle technologie pour le Sahel : cas du Niger.	
AKOHIN Dèlofon	Since 10/2022
Thesis · Mise en place d'une solution d'intelligence artificielle pour la prise en charge en imagerie médicale des accidents vasculaires cérébraux (AVC) dans les pays en développement.	
EHLAN Komi Boniface	Since 01/2023
Thesis · Silicon-based materials for energy applications from thermochemical conversion of rice husk.	
GAYOVO Mississo	Since 10/2023
Thesis · Optimisation multi-échelle des performances et de l'empreinte environnementale des grandes centrales solaires connectées au réseau : cas de la centrale de 50 MWc de Blitta, Togo.	

FORMER PH.D. STUDENTS

AMEGA Kokou	Graduated 05/2024
Thesis · Production d'énergie renouvelable sous changement climatique : smart grid décentralisé et système énergétique durable.	
KABE Moyème	Graduated 11/2020
Thesis · Études des performances, domaines d'application et fiabilité des cellules solaires à base de carbure de silicium 3C.	
TCHAKPEDEOU Abdoul-Baki	Graduated 12/2021
Thesis · Caractérisation de modules photovoltaïques en conditions réelles d'implantation au Togo.	
APEDANOU Gagnon Koffi	Graduated 10/2022
Thesis · Modélisation et simulation des transferts de chaleur et de masse dans les foyers améliorés en céramique en fonction des paramètres morphologiques.	
M.SC. STUDENTS	
LARE Yendoubouame	Graduated 03/2021
Thesis · Dimensionnement d'une installation photovoltaïque pour un aéroport international : cas de l'Aéroport International Gnassingbé Eyadéma (AIGE).	

Niyem M. Bawana · now Assistant Professor, University of Colorado Boulder (Electrical, Computer & Energy Engineering)	
Left on earning a Fulbright Scholarship for an M.Sc. in the U.S.A.	
Thesis · Assessing solar water heater system performance in Togo.	
AFODANYI Kodzovi Dzidula	Graduated 03/2021
Thesis · Étude de faisabilité de la réalisation d'une centrale solaire thermodynamique au Togo.	
BOUKALE Nardjouma	Graduated 03/2021
Thesis · Dimensionnement des stations solaires (fixes et mobiles) pour la recharge des motos électriques.	
SAMBIANI Kanlanfei · now Ph.D. student, Université de Lomé	Graduated 03/2021
Thesis · Recyclage des composants de systèmes solaires : contribution au développement d'une filière locale de valorisation.	
GBOGLO Déssoudji Alphonse	Graduated 09/2021
Thesis · Étude diagnostique des sources de pertes énergétiques sur les réseaux de distribution en Afrique subsaharienne : cas d'Abomey-Calavi (Bénin) et de Lomé-Golfe (Togo).	
GAYOVO Mississo · now Ph.D. student, Université de Lomé	Graduated 12/2022
Thesis · Élaboration et caractérisation de couches minces de sulfure de zinc (ZnS) par spray pneumatique pour applications photovoltaïques.	
ALI-TAGBA Abdoul-Razak	Graduated 09/2021
Thesis · Contribution à l'étude des systèmes solaires à injection réseau au Togo : contraintes et approches de solutions.	
ALI Gbati	Graduated 12/2021
Thesis · Dimensionnement de lampadaires solaires pour une utilisation en milieu tropical.	
KETCHEYA Wiyaou	Graduated 12/2021
Thesis · Dimensionnement du stockage de l'énergie produite par une centrale photovoltaïque : simulation et choix des composants.	
DEMOU Yaokuma	Graduated 09/2018
Thesis · Système de gestion des archives audiovisuelles : cas de la Télévision Togolaise (TVT).	
ABLORDEPPEY Komla Mawuli	Graduated 09/2018
Thesis · Implémentation d'une architecture réseau LAN sécurisée pour une entreprise.	
AMONA Gnintou Paterne	Graduated 09/2018
Thesis · Amélioration de la disponibilité des ressources informatiques au sein d'un système d'information.	
KPATCHA Essowè	Graduated 09/2020
Thesis · Conception d'un système de dématérialisation du processus de demande des attestations de diplôme à l'Université de Lomé.	
ADAM Guipelbé Jean	Graduated 09/2019
Thesis · Système de numérisation et de gestion des archives documentaires : cas de l'ODEF.	
DJOBBO Izandine	Graduated 09/2019
Thesis · QR codes et applications.	
SEKOU-AKOETE Kodjo Achille	Graduated 09/2019
Thesis · Intégration continue et qualité de code en environnement dockerisé.	
HOUINTAVO Vignon Hinnoukpo Bruno	Graduated 09/2020
Thesis · Étude et conception d'un système de numérisation intégrée des renseignements de gestion de vol dans l'espace ASECNA.	
SEDOH Koamivi Atassé Dieudonné	Graduated 09/2020
Thesis · Implémentation et déploiement d'une solution de télétravail pour l'autorité de régulation des marchés publics du Togo.	
AGOUNDEDEMBA Maklewa	Graduated 01/2019
Thesis · Conception d'une cuisinière solaire à partir de matériaux locaux : étude comparée de performance.	
KABLE Katchégbélé Yawovi	Graduated 01/2019

Thesis · Étude comparative d'une centrale solaire thermodynamique à concentration et d'une centrale photovoltaïque.		
BITASSA Mazimbolon		Graduated 03/2019
Thesis · Valorisation des énergies renouvelables dans les infrastructures universitaires : études techniques et économiques pour un amphithéâtre de 500 places.		
FOUSSENI Abdoul Djamilou		Graduated 03/2019
Thesis · Optimisation d'une installation solaire photovoltaïque en conditions réelles : principes, comportement des composants et aide à la décision.		
ABAYIZERA Thierry		Graduated 03/2019
Thesis · Conception d'un outil de dimensionnement optimal et de simulation en milieu réel de systèmes solaires autonomes par la méthode KEG.		
AMEGA Kokou		Graduated 03/2018
Thesis · Energy-efficiency potential and its impact on long-term electricity consumption in the urban residential sector: a case study of Lomé, Togo.		
KITEGI Mawunyo Simon Pierre		Graduated 07/2021
Thesis · Potential for green hydrogen production from biomass, solar and wind for the rising green-hydrogen economy in Togo.		

Teaching

Since 2016	Radiation–matter interactions Université de Lomé
Since 2016	Photovoltaic conversion Université de Lomé
Since 2016	Thin-film material fabrication methods Université de Lomé
Since 2016	Atomic and nuclear physics Université de Lomé
Since 2010	Magnetostatics Université de Lomé / Université de Kara
Since 2010	Electrostatics Université de Lomé / Université de Kara
Since 2010	Fundamental physics Université de Lomé
2006–2010	Applied physics Université de Lomé

Awards & recognition

Apr–Jul 2014	DAAD Cooperation Institute of Applied Physics, TU Dresden, Germany
Jul–Nov 2014	TWAS–DFG Cooperation Institute of Applied Physics, TU Dresden, Germany
Aug–Nov 2013	C. V. Raman Fellowship Indian Institute of Technology, Calicut, India
2009–2010	French Cooperation grant : postdoctoral University of Nantes, France
2009	French Cooperation grant : Ph.D.

	University of Nantes, France
2004	Prize for best student in Physics Université de Lomé, Togo

REFERENCES

References available upon request.