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**اتحاد الجامعات الافريقية**

**Ref. SG/ACE/WB/RV/01**

**Date: 13 September, 2016**

Mr. Andreas Blom  
Team Leader, ACE Project  
World Bank  
Washington, USA

Dear Mr. Andreas Blom,

**DISBURSEMENT TO PAMI FOR RESULTS ACHIEVED**

I bring you warm greetings from the AAU.

As agreed in the Financing Agreement and Minutes of Negotiation for each country participating in the Africa Centers of Excellence project, the results for the ACEs must be verified by the Association of African Universities (AAU). For this purpose, AAU has contracted two assisting consultancy firms. Accordingly, results pertaining to student enrollment and outreach (internships) were verified by Technopolis using online surveys and telephone calls. For research publication results, Elsevier verified publications in international journals using a list of researchers submitted by PAMI. The results from Elsevier were then further assessed for their relevance to the objectives of PAMI.

PAMI has further submitted documentation that its Eligible Expenditure Program for the period in question (February 25, 2015 – date of signing of the Financing Agreement to May 31, 2016) equals **NGN 615,240,232** equivalent to **SDR 1,340,884.72** of which **SDR 530,000** has previously been reimbursed for achievement of DL1. Therefore, the remaining EEP that potentially could be reimbursed amounts to **SDR 810,884.72**. This exceeds the amount that the results verified are valued at (**SDR 701,625**).

Based on the verified results for DLRs 2.1 - 2.6 and the reported EEP, the AAU wishes to recommend a disbursement of a total of **SDR 701,625** to PAMI. The amount represents earnings for the results achieved over the period 2014 – 2015 being the first year of the ACE Project. The results for DLRs 2.1 – 2.5 have been shared and discussed with the ACE in question.



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Please find attached a schedule of the DLRs achieved and the associated earnings. Also attached is a list of verified results for DLR 2.6 (Research Publications).

Thank you in anticipation of your prompt response.

Yours in the service of higher education in Africa,

Prof. Etienne Ehile  
Secretary General.

cc: Prof. Omololu Akin-Ojo  
[oakinojo@gmail.com](mailto:oakinojo@gmail.com)

# African Centre of Excellence for Pan African Material Institute (PAMI)

## African University of Science & Technology, Nigeria

### VERIFICATION OF OCTOBER 2015 RESULTS SUMMARY REPORT (DLRs 2.1 – 2.7)

DLR Indicators	<a href="#">Total Results reported by ACEs for 2014/2015<sup>[1]</sup></a>	Verified Results	Unit Cost (SDR)	Total Cost (SDR)	Maximum SDR per DLR	Total DLR Earnings	Balance of SDR per DLR
<b>2.1 New Short term students</b>	<b>257</b>	<b>98</b>		<b>39,000</b>	<b>250,000</b>	<b>39,000</b>	<b>211,000</b>
National and men	108	41	260	10,660			
National and women	31	12	325	3,900			
Regional and men	96	37	520	19,240			
Regional and women	22	8	650	5,200			
<b>2.2 New Master students</b>	<b>34</b>	<b>14</b>		<b>27,625</b>	<b>250,000</b>	<b>27,625</b>	<b>222,375</b>
National and men	9	4	1,300	5,200			
National and women	6	5	1,625	8,125			
Regional and men	13	3	2,600	7,800			
Regional and women	6	2	3,250	6,500			
<b>2.3 New PhD students</b>	<b>18</b>	<b>12</b>		<b>125,000</b>	<b>250,000</b>	<b>125,000</b>	<b>125,000</b>
National and men	6	4	6,250	25,000			
National and women	1	0	7,800	0			
Regional and men	11	8	12,500	100,000			
Regional and women	0	0	15,600	0			
<b>2.4 Number of outreach "periods"</b>	<b>0</b>	<b>0</b>		<b>0</b>	<b>510,000</b>	<b>0</b>	<b>510,000</b>
National		0	1,300	0			
Regional		0	2,600	0			
<b>2.5 Accreditation</b>	<b>0</b>	<b>0</b>		<b>0</b>	<b>510,000</b>	<b>0</b>	<b>510,000</b>
<b>2.5 (A) International accreditation</b>	<b>0</b>	<b>0</b>	<b>390,000</b>	<b>0</b>			
<b>2.5 (B) National accreditation</b>	<b>5</b>	<b>0</b>	<b>65,000</b>	<b>0</b>			
<b>2.5 (C) Gap assessment verified</b>	<b>0</b>	<b>0</b>	<b>65,000</b>	<b>0</b>			
<b>2.5 (D) CAMES certification</b>	<b>0</b>	<b>0</b>	<b>65,000</b>	<b>0</b>			
<b>2.5 (E) Bologna Compliant programs</b>	<b>0</b>	<b>0</b>	<b>65,000</b>	<b>0</b>			
<b>2.5 (F) Self-Evaluation</b>	<b>0</b>	<b>0</b>	<b>65,000</b>	<b>0</b>			
<b>2.6 Research Publications<sup>[1]</sup></b>	<b>68</b>	<b>54</b>		<b>1,005,000</b>	<b>510,000</b>	<b>510,000</b>	<b>0</b>
Regional Collaboration	18	13	30,000	390,000			
No Regional Collaboration	50	41	15,000	615,000			
<b>2.7 External Revenue</b>					<b>760,000</b>	<b>0</b>	
<b>TOTALS</b>				<b>1,196,625</b>	<b>3,040,000</b>	<b>701,625</b>	<b>1,578,375</b>
<b>TOTAL AMOUNT TO BE DISBURSED</b>				<b>701,625</b>			



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SUMMARY REPORT  
VERIFIED RESEARCH PUBLICATIONS

ACEs	Title	Authors	Relevance to ACE	Co-author in Africa?	DLI EARNING (SDR)
PAMI	Adhesion and degradation of organic and hybrid organic-inorganic light-emitting devices	Momodou D.Y.; Chioh A.V.; Soboyejo W.O.; Tong T.; Zebaze Kana M.G.	YES	YES	\$30,000
PAMI	Adhesion in flexible organic and hybrid organic/inorganic light emitting device and solar cells	Yu D.; Kwabi D.; Tong T.; Akogwu O.; Du J.; Soboyejo W.O.; Oyewole O.K.; Asare J.; Fashina A.; Anye V.C.; Rwenyagila E.	YES	YES	\$30,000
PAMI	Classification of cervical cancer tissues using a novel low cost methodology for effective screening in rural settings	Mustafa S.; Dauda M.; Adeshina S.; Soboyejo W.	NO	YES	\$0
PAMI	Consideration for M&S in Africa	Adegoke A.; Traore M.K.	NO	YES	\$0
PAMI	Development and comparative analysis of aluminosilicate based ceramic filters for ground water defluoridation	Efavi J.K.; Yaya A.; Adeborna S.; Fobil J.	YES	YES	\$30,000
PAMI	Gold nanoparticles for cancer detection and treatment: The role of adhesion	Oni Y.; Soboyejo W.O.; Anuku N.; Hao K.; Dozie-Nwachukwu S.; Obayemi J.D.; Odusanya O.S.	YES	YES	\$30,000
PAMI	Hydration status in Nigeria: A cross-sectional study	Olufadi Y.; Olorede K.O.; Dauda A.K.; Soboyejo A.B.O.	NO	YES	\$0
PAMI	Implantable magnetic nanocomposites for the localized treatment of breast cancer	Kan-Dapaah K.; Soboyejo W.; Rahbar N.	YES	YES	\$30,000
PAMI	Mode mixity dependence of interfacial fracture toughness in organic electronic structures	Tong T.M.; Tan T.; Rahbar N.; Soboyejo W.O.	YES	YES	\$30,000
PAMI	Optical properties of ZnO/Al/ZnO multilayer films for large area transparent electrodes	Rwenyagila E.R.; Agyei-Tuffour B.; Soboyejo W.O.; Zebaze Kana M.G.; Akin-Ojo O.	YES	YES	\$30,000
PAMI	Population increases in non-breeding sanderlings in ghana indicate site preference	Ntiamoa-Baidu Y.; Nuoh A.A.; Reneerkens J.; Piersma T.	NO	YES	\$0



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ACEs	Title	Authors	Relevance to ACE	Co-author in Africa?	DLI EARNING (SDR)
PAMI	Pressure-assisted fabrication of organic light emitting diodes with MoO <sub>3</sub> hole-injection layer materials	Du J.; Tong T.; Soboyejo W.O.; Anye V.C.; Vodah E.O.; Zebaze Kana M.G.	YES	YES	\$30,000
PAMI	Prodigiousin release from an implantable biomedical device: Kinetics of localized cancer drug release	Danyuo Y.; Obayemi J.D.; Dozie-Nwachukwu S.; Soboyejo W.O.; Ani C.J.; Odusanya O.S.; Oni Y.; Anuku N.; Malatesta K.	YES	YES	\$30,000
PAMI	Statistics of flow and the scaling of ceramic water filters	Annan E.; Mustapha K.; Odusanya O.S.; Malatesta K.; Soboyejo W.O.	YES	YES	\$30,000
PAMI	Studies on sandwiched electrospun scaffold of isomers of poly (lactic acid) (PLA) used in tissue engineering	Akpan U.M.; Taylor B.; Freeman J.; Odusanya S.; Soboyejo W.	YES	YES	\$30,000
PAMI	Synthesis and microstructural characterization of kaolin-polyethylene composites	Agyei-Tuffour B.; Bensah Y.D.; Damoah L.N.W.; Dodoo-Arhin D.; Yaya A.; Nyankson E.; Annan E.; Sarkodee E.; Efavi J.K.	YES	YES	\$30,000
PAMI	System of systems based approaches to global simulation in Africa	Adegoke A.; Traore M.K.	NO	YES	\$0
PAMI	Z-scan and optical limiting properties of Hibiscus Sabdariffa dye	Diallo A.; Zongo S.; Mthunzi P.; Rehman S.; Alqaradawi S.Y.; Maaza M.; Soboyejo W.	YES	YES	\$30,000
PAMI	Potential of bamboo organosolv pulp as a reinforcing element in fiber-cement materials	Correia V.D.C.; Marmol G.; Savastano H.; Santos S.F.; Curvelo A.A.D.S.	YES	UNKNOWN	\$15,000
PAMI	A fast I-V screening measurement for tddb assessment of ultra-thick inter-metal dielectrics	Khorasani A.E.; Griswold M.; Alford T.L.	YES	NO	\$15,000
PAMI	A fast technique to screen carrier generation lifetime using DLTS on MOS capacitors	Elhami Khorasani A.; Schroder D.K.; Alford T.L.	YES	NO	\$15,000
PAMI	A system-theoretic approach to case management	Wang S.; Traore M.K.	NO	NO	\$0
PAMI	Analysis of the stresses in corrugated sheets under bending	Molina J.C.; Fiorelli J.; Savastano Jr. H.	YES	NO	\$15,000



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PAMI	Atomic state and characterization of nitrogen at the SiC/SiO <sub>2</sub> interface	Xu Y.; Zhu X.; Lee H.D.; Xu C.; Shubeita S.M.; Gustafsson T.; Garfunkel E.L.; Feldman L.C.; Ahyi A.C.; Sharma Y.; Williams J.R.; Lu W.; Ceesay S.; Tuttle B.R.; Pantelides S.T.; Wan A.	YES	NO	\$15,000
PAMI	Author's retrospective for: Improving the performance of speculatively parallel applications on the hydra CMP	Olukotun K.; Hammond L.; Willey M.	YES	NO	\$15,000
PAMI	Characterization and properties of elephant grass ashes as supplementary cementing material in pozzolan/Ca(OH) <sub>2</sub> pastes	Nakanishi E.Y.; Rodrigues M.S.; Savastano H.; Frias M.; Rodriguez O.; Martinez-Ramirez S.; Santos S.F.	YES	NO	\$15,000
PAMI	Characterizing and addressing student learning issues and misconceptions (SLIMs) in materials science with muddiest point reflections and fast formative feedback	Krause S.J.; Baker D.R.; Carberry A.R.; Alford T.L.; Ankeny J.; Koretsky M.; Brooks B.J.; Waters C.; Gibbons B.J.; Maass S.; Chan C.K.	NO	NO	\$0
PAMI	Chemical and structural investigation of high-resolution patterning with HafSO <sub>x</sub>	Oleksak R.P.; Ruther R.E.; Herman G.S.; Decker S.R.; Keszler D.A.; Luo F.; Garfunkel E.L.; Fairley K.C.; Johnson D.W.; Stickle W.F.	YES	NO	\$15,000
PAMI	Contact behavior of soft spherical tactile sensors	Youssefian S.; Rahbar N.; Torres-Jara E.	YES	NO	\$15,000
PAMI	Crowded hybrid panel manufactured with peanut hulls reinforced with ita <sup>o</sup> ba wood particles Painei aglomerado hã-bridido de casca de amendoim reforãçado com partãculas de madeira ita <sup>o</sup> ba	Barbirato G.; Barrero N.G.; Fiorelli J.; Pallone E.M.J.A.; Savastano H.; Lahr F.A.R.; Cristoforo A.L.	YES	NO	\$15,000
PAMI	Delite: A compiler architecture for performance-oriented embedded domain-specific languages	Sujeeth A.K.; Brown K.J.; Lee H.; Olukotun E.K.; Rompf T.; Chafi H.; Odersky M.	NO	NO	\$0
PAMI	Density profile as a tool in assessing quality of new comp	Belini U.L.; Fiorelli J.; Savastano Jr.H.; Tomazello Filho M.	YES	NO	\$15,000



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PAMI	DEVS-based case management (WIP)	Wang S.; Traore M.K.	NO	NO	\$0
PAMI	Different ageing conditions on cementitious roofing tiles reinforced with alternative vegetable and synthetic fibres	Teixeira R.S.; Lahr F.A.R.; Tonoli G.H.D.; Protasio T.P.; Santos S.F.; Savastano Jr. H.; Toro E.F.; Maldonado J.; Delvasto S.	YES	NO	\$15,000
PAMI	Effect of accelerated carbonation on the microstructure and physical properties of hybrid fiber-cement composites	Pizzol V.D.; Mendes L.M.; Tonoli G.H.D.; Frezzatti L.; Savastano Jr. H.	YES	NO	\$15,000
PAMI	Effect of Ag layer thickness on the electrical transport and optical properties of ZnO/Ag/MoOx transparent composite electrodes and their use in P3HT:PC61BM-based organic solar cells	Das S.; Alford T.L.; Woo Choi H.	YES	NO	\$15,000
PAMI	Effect of colloidal silica on the mechanical properties of fiber-cement reinforced with cellulosic fibers	Santos S.F.; De Anchieta Rodrigues J.; Tonoli G.H.D.; De Souza Almeida A.E.F.; Savastano Jr. H.	YES	NO	\$15,000
PAMI	Effects of surface treatment on bond strength between dental resin agent and zirconia ceramic	Moradabadi A.; Roudsari S.E.S.; Rahbar N.; Yekta B.E.	YES	NO	\$15,000
PAMI	Energy level alignment of polythiophene/ZnO hybrid solar cells	Feng W.; Garfunkel E.; Rangan S.; Bartynski R.A.; Cao Y.; Galoppini E.	YES	NO	\$15,000
PAMI	Enhanced power conversion efficiency of organic solar cells by embedding Ag nanoparticles in exciton blocking layer	Kim I.; Lee T.S.; Jeong D.S.; Lee W.S.; Lee K.S.; Fleetham T.; Choi H.-W.; Choi J.-Y.; Alford T.L.; Li J.; Lee Y.-K.	YES	NO	\$15,000
PAMI	Fibronectin adsorption on functionalized electrospun polycaprolactone scaffolds: Experimental and molecular dynamics studies	Regis S.; Jassal M.; Bhowmick S.; Youssefian S.; Phaneuf M.D.; Rahbar N.	YES	NO	\$15,000
PAMI	Flexible sensors based on radiation-induced diffusion of Ag in chalcogenide glass	Dandamudi P.; Mahmud A.; Gonzalez-Velo Y.; Kozicki M.N.; Barnaby H.J.; Holbert K.E.; Roos B.; Alford T.L.; Ailavajhala M.; Mitkova M.	YES	NO	\$15,000





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PAMI	Fracture toughness of the sidewall fluorinated carbon nanotube-epoxy interface	Ganesan Y.; Peng C.; Zhang J.; Cate A.; Lou J.; Salahshoor H.; Rahbar N.; Khabashesku V.	YES	NO	\$15,000
PAMI	Gate-controlled reverse recovery for characterization of LDMOS body diode	Khorasani A.E.; Griswold M.; Alford T.L.	YES	NO	\$15,000
PAMI	Hardware acceleration of database operations	Casper J.; Olukotun K.	YES	NO	\$15,000
PAMI	Hardware system synthesis from Domain-Specific Languages	George N.; Novo D.; Rompf T.; Odersky M.; lenne P.; Lee H.; Brown K.J.; Sujeeth A.K.; Olukotun K.	YES	NO	\$15,000
PAMI	Improved efficiency of P3HT:PCBM solar cells by incorporation of silver oxide interfacial layer	Das S.; Alford T.L.	YES	NO	\$15,000
PAMI	Improving the performance of speculatively parallel applications on the hydra CMP	Olukotun K.; Hammond L.; Wiley M.	YES	NO	\$15,000
PAMI	Integrin $\alpha 5 \beta 1$ -mediated attachment of NIH/3T3 fibroblasts to fibronectin adsorbed onto electrospun polymer scaffolds	Regis S.; Jassal M.; Bhowmick S.; Youssefian S.; Phaneuf M.; Rahbar N.	YES	NO	\$15,000
PAMI	JTF web-enabled faculty and student tools for more effective teaching and learning through two-way, Frequent Formative Feedback	Krause S.J.; Carberry A.R.; Baker D.R.; Alford T.L.; Ankeny C.J.; Koretsky M.; Brooks B.J.; Gilbuena D.M.; Waters C.; Gibbons B.J.; Stuart W.J.; Maass S.; Chan C.K.	NO	NO	\$0
PAMI	Kinetics of nitrogen incorporation at the SiO <sub>2</sub> /4H-SiC interface during an NO passivation	Chen Z.; Xu Y.; Garfunkel E.; Feldman L.C.; Buyuklimanli T.; Ou W.; Serfass J.; Wan A.; Dhar S.	YES	NO	\$15,000
PAMI	Mechanical behavior of a glass fiber-reinforced polymer sandwich panel with through-thickness fiber insertions	Lanssens T.; Tanghe C.; Van Dessel S.; Rahbar N.; El-Korchi T.; Okumus P.	YES	NO	\$15,000
PAMI	Mineralogical and microstructural changes promoted by accelerated carbonation and ageing cycles of hybrid fiber-cement composites	Pizzol V.D.; Mendes L.M.; Tonoli G.H.D.; Savastano H.; Frias M.; Davila F.J.; Cincotto M.A.; John V.M.	YES	NO	\$15,000





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PAMI	Modeling a bending resistance modulus for a cementitious material compound based on properties in fresh state Modelaci3n del m3dulo de la resistencia a la flexi3n de un material compuesto cementicio a partir de propiedades en estado fresco	Toro F.; Gordillo M.; Delvasto S.; Savastano Jr. H.	YES	NO	\$15,000
PAMI	Multi-scale mechanical and transport properties of a hydrogel	Salahshoor H.; Rahbar N.	YES	NO	\$15,000
PAMI	Optically excited mos-capacitor for recombination lifetime measurement	Khorasani A.E.; Schroder D.K.; Alford T.L.	YES	NO	\$15,000
PAMI	Optimization of TiO2/Cu/TiO2 multilayer as transparent composite electrode (TCE) deposited on flexible substrate at room temperature	Dhar A.; Alford T.L.	YES	NO	\$15,000
PAMI	Oxygen incorporation in rubrene single crystals	Mastrogiovanni D.D.T.; Garfunkel E.; Mayer J.; Wan A.S.; Vishnyakov A.; Neimark A.V.; Podzorov V.; Feldman L.C.	YES	NO	\$15,000
PAMI	Self-assembled monolayer modified ITO in P3HT:PC61BM organic solar cells with improved efficiency	Das S.; Alford T.L.; Joslin J.	YES	NO	\$15,000
PAMI	Simplifying scalable graph processing with a domain-specific language	Hong S.; Salihoglu S.; Widom J.; Olukotun K.	NO	NO	\$0
PAMI	Solvent-controlled spin-coating method for large-scale area deposition of two-dimensional silica nanosphere assembled layers	Choi J.-Y.; Alford T.L.; Honsberg C.B.	YES	NO	\$15,000
PAMI	Structural properties of ZnO nanowires directly grown on a carbon film in ZnCl2aqueous solution	Choi H.W.; Theodore N.D.; Das S.; Dhar A.; Alford T.L.	YES	NO	\$15,000
PAMI	Study of hygral behavior of NON-asbestos fiber cement made by similar hatschek process	Gomes C.E.M.; Savastano Jr. H.	YES	NO	\$15,000
PAMI	Surgical precision JIT compilers	Rompf T.; Chafi H.; Sujeeth A.K.; Brown K.J.; Lee H.J.; Olukotun K.	NO	NO	\$0



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PAMI	Surgical precision JIT compilers	Rompf T.; Chafiz H.; Sujeeth A.K.; Brown K.J.; Lee H.; Olukotun K.	NO	NO	\$0
PAMI	Thermal and chemical treatments for removal of alkali oxides of elephant grass ashes Tratamentos térmico e químico para remoção de óxidos alcalinos de cinzas de capim elefante	Nakanishi E.Y.; Santos S.F.; Pinto P.S.; Savastano Jr. H.; Villar-Cocina E.; Rodrigues M.S.	YES	NO	\$15,000
PAMI	Thin PSG process for 4H-SiC MOSFET	Sharma Y.K.; Jennings M.R.; Fisher C.; Thomas S.M.; Mawby P.; Ahyi A.C.; Issacs-Smith T.; Modic A.; Dhar S.; Williams J.R.; Xu Y.; Garfunkel E.; Feldman L.C.	YES	NO	\$15,000
PAMI	Variability in bioreactivity linked to changes in size and zeta potential of diesel exhaust particles in human immune cells	Sarkar S.; Zhang L.; Schwander S.; Subramaniam P.; Lee K.-B.; Garfunkel E.; Ohman Strickland P.A.; Mainelis G.; Lioy P.J.; Tetley T.D.; Chung K.F.; Zhang J.; Ryan M.; Porter A.	NO	NO	\$0
					<b>\$1,005,000</b>