



Association of Nigerian  
Scholars in Hong Kong (ANSHK)  
Research Forum '2020

**Innovations in Arts, Science  
and Technology**

Saturday 27<sup>th</sup> June 2020

**Research Forum Proceedings**

Prepared by 2020 Research Forum Committee

Dr Akinniyi Damilola (Chair)

Mr Adeoti Blessing

Ms Kindness Uyanga

## Acknowledgments

The Committee of the 2020 ANSHK Research Forum would like to thank the ANSHK Executives for the opportunity to serve our scholars in this regard. Also, we would like to acknowledge the excellent work of our reviewers, guest presenters and session chairs which comprised of the following:

### Reviewers

- Dr Sojobi Adebayo
- Dr Tijani Ibrahim
- Dr Sanusi Ridwan
- Engr Onyekwere Smith
- Mr Idorenyin Iwe
- Ms Salaudeen Mistura
- Mr Onwachukwu Chinedu
- Mr Taiwo Enayon
- Mrs Ugwuanyi Ijeoma
- Ms Uyanga Kindness
- Mr Adesina Ayotunde

### Guest Presenters

- Dr Akinsanola Akintomide
- Ms Salaudeen Mistura
- Mr Ola Bamidele

### Session Chairs

- Ms Uyanga Kindness
- Ms Adesanya Adenike
- Dr Soyinka Oluwole
- Mr Iwe Idorenyin

We would like to acknowledge the important contributions of all our forum participants and in particular those who shared with us their personal insights and aspirations.

## **Foreword**

**Dear Authors and Esteemed Readers,**

It is with deep satisfaction that I write this foreword to the Proceedings of the ANSHK Research Forum held online via zoom in Hong Kong on June 27, 2020.

ANSHK Research Forum, an annual program, continues the tradition of bringing together our distinguished scholars and professionals from different research backgrounds including science, arts and social sciences. For the year 2020, the forum consists of 4 plenary sessions, with 3 invited presenters and 7 contributed abstracts. This is the highest number of presentations recorded so far since the inception of the Research Forum.

The main aim of the forum is to encourage research interaction among our distinguished scholars and senior colleagues who are working in the academia and industry. The forum is an informal setting where scholars can present and discuss new and current work. Through this forum, we do hope that research collaborations among our scholars would be enhanced in the future. The contributions from every member of ANSHK helped to make 2020 research forum an outstanding one. The abstracts and presentations contributed the most recent scientific knowledge known in the field of Science and Technology, Business and Economics, Social Sciences and Humanities and Law in Society. To provide an excellent feedback for our presenters, we designed a presentation assessment form and the link is included at the end of each abstract. Through this link, audience can provide comments and suggestions that would help presenters to improve their work and presentation skills.

In addition to the contributed papers, three invited guest presentations will be given by Dr. Akinsanola Akintomide of Department of Geography, University of Georgia, United States, Ms Salaudeen Mistura of Department of Journalism, Hong Kong Baptist University, Hong Kong and Mr Bamidele Ola of Department of Sociology, Hong Kong Baptist University, Hong Kong. Their presentations cover topics relating to climate change, gender equality and media awareness.

The 2020 Research Proceedings will serve as an excellent reference book to furnish researchers of the world. I also trust that this will be an impetus to stimulate further study and research in all these areas.

I thank all authors, reviewers, session chairs and participants for their contributions.

**Akinniyi Damilola**

**Chair, 2020 ANSHK Research Forum**

## **Table of Contents**

**Acknowledgments**

**Foreword**

**Introduction**

**Session 1: Environmental Science** **2:25 pm – 2:55 pm**

**Chair: Ms Kindness Uyanga**

**Presenter 1:** Dr Akinsanola Akintomide Afolayan

**Presentation Title:** Understanding the Variability of West African Summer Monsoon Rainfall: Contrasting Tropospheric Features and Monsoon Index

**Presenter 2:** Mr Adeoti Blessing

**Presentation Title:** Element mobility as a proxy for defining the width of shear zones for mineral exploration and geo-environmental planning.

**Session 2: Gender and Media** **2:55 pm – 3:35 pm**

**Chair: Ms Adesanya Adenike**

**Presenter 3:** Mr Ola Bamidele

**Presentation Title:** Interregional Comparison of Trends, Patterns and Correlates of Intimate Partner Violence Against Women in Nigeria (2008-2018)

**Presenter 4:** Mrs Ugwuanyi Ijeoma Priscilla

**Presentation Title:** Women in Firm Upper Echelons and Innovation: Does International Aid Matter?

**Presenter 5:** Ms Salaudeen Mistura

**Presentation Title:** Digital Media vs Mainstream Media: Influence of Media Exposure and Information Preference on Perceptions of Media Credibility

**Session 3: Materials Science**

**3:35 pm – 4:00 pm**

**Chair: Mr Iwe Idorenyin**

**Presenter 6:** Ms Uyanga Kindness

**Presentation Title:** Effect of post annealing on performance of ZnO/P3HT:PCBM based inverted geometry organic solar cell

**Presenter 7:** Dr Olugbade Temitope

**Presentation Title:** Passivation Behaviour and Corrosion Properties of Surface Mechanically Treated 17-4 PH Stainless Steel

**Session 4: Law and Commerce**

**4:00 pm – 4:35 pm**

**Chair: Dr Soyinka Oluwole**

**Presenter 8:** Mr Onwachukwu I. Chinedu

**Presentation Title:** Trade Liberalization and State Capitalism: Assessing the Effect of Trade Shock on Workers' Welfare

**Presenter 9:** Mr Taiwo S. Enayon

**Presentation Title:** Appointment Scheduling for Physician and Nurse Practitioner Providers' Outpatient Clinic

**Presenter 10:** Mr Adekola Tolulope Anthony

**Presentation Title:** R&D, Innovation and Patent Law- Balancing Rights and Obligations

**Closing Remarks**

**4:35 pm – 4:45 pm**

## **Introduction**

**Dear Participants,**

A warm welcome to you!

It is my pleasure to welcome you to the annual ANSHK Research Forum for this year 2020. The city of Hong Kong in the past few months has experienced several challenges ranging from social unrest to the current COVID-19 outbreak – which is a global issue – and has affected the social life, academic, and research works, among others. Hence, the organizing committee for this year's ANSHK Research Forum adopted the online conferencing mode (via Zoom) to comply with the current social-distancing policies of the Hong Kong SAR government.

This Research Forum (RF) is unprecedented in the annals of the ANSHK Research Forum, as it is the first RF to be organized in the form of conference proceedings. More so, there are efforts by the Research Committee for the 2019/2020 session in conjunction with the ANSHK Executives to have these RF proceedings published online and indexed in relevant conference proceedings databases. Also, a total of 10 presenters (inclusive of 3 guest presenters) will be presenting various researches bordering on the research themes such as – Environmental Science, Gender and Media, Material Science, and Law and Commerce – this is another first recorded in this current RF event. Also, various session chairs have been invited to anchor the four research themes sessions.

I do hope that this ANSHK Research Forum helps you to interact and network with possible future research collaborators. To the presenters: I hope your research presentations will stimulate discussions on the topic and that you can get relevant feedback from other participants towards improving your current work. With our collective efforts, now and beyond, the ANSHK Research Forum will transform into a platform for academics over the world to share their insights and foster networking for potential project collaborations.

I would like to appreciate the ANSHK Research Committee led by Dr. Damilola Akinniyi, the research abstracts reviewers, presenters, and the session chairs for their support towards the organization of this notable and historic 2019/2020 ANSHK Research Forum. Much thanks to the ANSHK Executives and members for their support towards this outstanding event and other ANSHK programs.

May I wish you all the best in this ANSHK Research Forum and your career, this time forward.

Yours faithfully,

**Dr. Timothy O. Olawumi**

*ANSHK President (2019/2020 session)*

## **Session 1: Environmental Science**

### **Welcome Address**

Distinguished colleagues,

Welcome to the first session of the 2020 Association of Nigerian Students in Hong Kong Research Forum on Environmental Science! It is with great pleasure that I usher you all into this 30 minutes session which will include two presentations- one from our esteemed guest speaker, Dr **Akinsanola Akintomide Afolayan** and the other from our own noble young man, **Mr Blessing Adeoti**. Dr Afolayan will be enlightening us on tropospheric features influencing the West African South Monsoon rainfall while Mr Adeoti will enlighten us on element mobility in rock exploration and shearing - a new and safer approach to determine the width of shear zones accurately.

It is my hope that you will find these two presentations not only insightful and informative but a productive seed for further research, innovation and developmental impact in the field of environmental science. I assure us that this session will be timely. Our first speaker will present in 15 minutes, while the second speaker has 7 minutes. Since we have 3 minutes for Q&A, please send your questions while the presentation is going on using the chat feature on zoom. We also request that all in attendance give an assessment of each presentation by completing the online questionnaire using the link found at the end of your copy of the abstract. You may also include your questions and comments to the presenter on the questionnaire.

So, please sit back, relax, listen so as to learn from this session.

Thank you!

**Uyanga Kindness (Session Chair),**

Energy Harvesting and Wearable Energy Technologies,

School of Energy and Environment,

City University of Hong Kong, Hong Kong SAR.

# Understanding the Variability of West African Summer Monsoon Rainfall: Contrasting Tropospheric Features and Monsoon Index

Akintomide Afolayan Akinsanola <sup>1,2,\*</sup> and Wen Zhou <sup>2</sup>

<sup>1</sup> Department of Geography, University of Georgia, Athens, GA 30602, USA

<sup>2</sup> Guy Carpenter Asia-Pacific Climate Impact Centre, School of Energy and Environment, City University of Hong Kong, Hong Kong SAR, China; wenzhou@cityu.edu.hk

\* Correspondence: akinsanola@uga.edu

West African Summer Monsoon (WASM) rainfall exhibits large variability at interannual and decadal timescales, causing droughts and floods in many years. Therefore, it is important to investigate the major tropospheric features controlling the WASM rainfall and explore its potential to develop an objective monsoon index. In this study, monthly mean reanalysis data from the National Centers for Environmental Prediction/National Center for Atmospheric Research (NCEP/NCAR) and monthly rainfall data from three gridded observations during the 65-year period of 1950–2014 were employed. Dry and wet rainfall years were identified using a standardized precipitation index. In a composite analysis of wet and dry years, the dynamical features controlling the WASM exhibit an obvious contrast between these years, and a weaker (stronger) African Easterly Jet (Tropical Easterly Jet) is observed during the wet years. Also, a well-developed and deep low-level westerly flow at about 850 hPa is evident in wet years while an obvious reversal is observed in dry years. Considering this, the main regions of the two easterly jet streams and low-level westerly wind are proposed for objectively defining an effective WASM index (WASMI). The results indicate that the WASMI defined herein can reflect variations in June–September rainfall over West Africa. The index exhibits most of the variabilities observed in the rainfall series, with high (low) index values occurring in the 1950–1960s (1970–1980s), suggesting that the WASMI is skilled in capturing the respective wet and dry rainfall episodes over the region. Also, the WASMI is significantly correlated ( $r = 0.8$ ) with summer monsoon rainfall, which further affirms that it can indicate not only variability but also the intensity of WASM rainfall.

**Keywords:** precipitation; African Easterly Jet; Tropical Easterly Jet; atmospheric circulation

Link to presentation assessment form: [shorturl.at/nISV6](http://shorturl.at/nISV6)

# Element mobility as a proxy for defining the width of shear zones for mineral exploration and geo-environmental planning

Blessing Adeoti (badeoti@hku.hk)

Department of Earth Sciences, University of Hong Kong, Hong Kong SAR, China.

Shear zones are localized regions of intense deformation and they are important archives of element mobility during continental crust deformation. They are also favourable pathways for releasing seismic energy that could lead to geo-environmental hazards with strong economic impacts. The existing methods of determining the width of shear is impeded by the coupling effect of rock deformation fabrics, leading to inaccurate estimation. This inaccuracy has important implication on environmental hazards management and mineral exploration programs.

A new approach involving element mobility in rock across shear zone is proposed as a proxy to define the accurate width of shear zones (Fig. 1). Shear zone formation involves bulk chemical changes in the affected rock (Hippert, 1998; Gonclaves et al., 2012). Tracking the changes can accurately define the boundaries between the sheared rock and its unsheared parent rock.

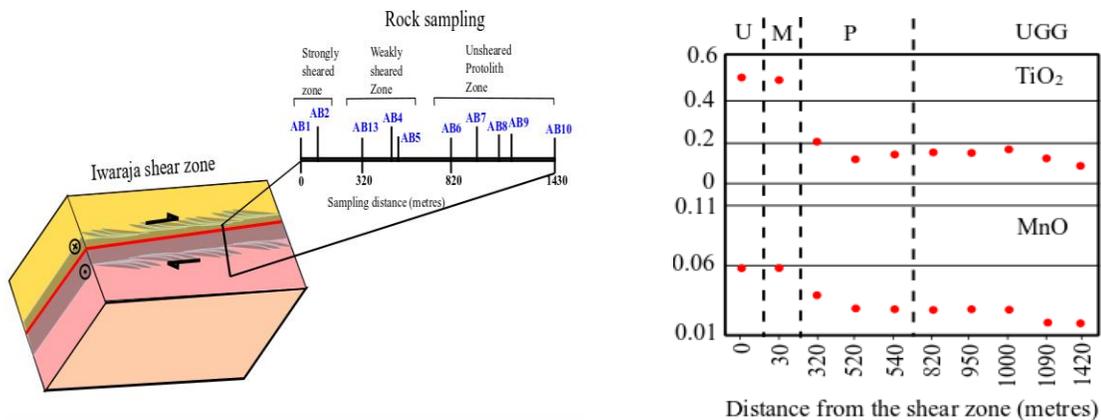


Figure 1: The sampling approach across the Iwaraja shear zone (left) and percentage volume change in TiO<sub>2</sub> and MnO concentrations across the Iwaraja shear zone.

The element mobility study reveals that the Iwaraja shear zone (ISZ) in southwest Nigeria, is a CaO-MgO-Fe<sub>2</sub>O<sub>3</sub>-enriched and Na<sub>2</sub>O-Rb-Th-depleted shear zone system. Based on these chemical signatures, the width of the ISZ in the affected granite gneiss is ~ 680 m. This estimate is ~100 m greater than the previous estimation of ~580 m, which was based on geophysical study and geological mapping.

The difference in thickness estimation has important implications for environmental hazards management where important engineering structures are to be erected. Mineral exploration programme will also benefit from knowing the accurate extent of area where important mineral deposits may be located because shear zones are conduits for mineral deposition.

**Keywords:** shear zone; element mobility; continental deformation; mineral exploration; environmental hazard planning.

Link to presentation assessment form: [shorturl.at/mG016](http://shorturl.at/mG016)

## **Session 2: Gender and Media**

### **Welcome Address**

Distinguished members,

I would like to welcome you all to this session on “Gender and Media”. In this session, we have the privilege to listen to three presenters – Mr Bamidele, whose topic is on Intimate Partner Violence against Women in Nigeria, Ms Ugwuanyi – will explore the influence of women in upper echelons in firm product and process innovation, and Ms. Salaudeen – will walk us through media credibility and perception of Nigerian audiences to disseminated media contents.

Speakers have a presentation time of 7-10 minutes and Q&A sessions between 3-5 mins. For anyone who has comments or suggestions, it would be best to use the link at the bottom of the each abstracts in the conference proceedings.

I hope we would all enjoy this session.

Thank you very much.

**Adenike Adesanya (Session Chair)**

The Department of Health Technology and Informatics,  
Hong Kong Polytechnic University.

# **Interregional Comparison of Trends, Patterns and Correlates of Intimate Partner Violence Against Women in Nigeria (2008-2018)**

**Bamidele Emmanuel Ola** (awesomebami@gmail.com)

Department of Sociology, Faculty of Social Sciences, Hong Kong Baptist University,  
Hong Kong SAR, China.

Intimate partner violence (IPV) is a global public health pandemic that affects more than one-third of ever-partnered women across the globe. Despite several studies on IPV, our knowledge of the trends and patterns in acceptance and actual experience of IPV victimization across different societies is still grossly limited. In the current study, the author employed three consecutive waves of the nationally-representative [Nigeria] Demographic and Health Survey [NDHS], to examine how women's acceptance of wife-beating and actual experiences of physical, sexual and emotional violence from husband, have changed over a period of ten years, comparatively across the six geopolitical zones of Nigeria. It also systematically identified the socioeconomic factors associated with women's IPV experiences at each wave. In all, the total samples were 47,755 currently-in-union women, aged 15-49 years old: NDHS 2008 (18,402), 2013 (21,004), 2018 (8,349). Data analysis involved preliminary bivariate chi-squared test of significance and multivariate logistic regression models. Result shows that while women's acceptance of IPV declined nationally from 49.5% in 2008 to 29.2% in 2018, women's actual IPV victimization grew from 27.2% to 29.7% over the same period. IPV tolerance was lowest in the South West region at 24.5%, and highest in the North East at 54.5%. Multivariate logistic regression result of pooled data shows that patriarchal gender ideologies, husband's alcohol misuse, large family size, polygyny, young age and higher relative resources than husband were positive associated with IPV perpetration and victimization against women in Nigeria. Among the regions, North East region, followed by North Central manifested the highest odds of spousal violence against women. Policy implications and recommendations are discussed.

**Keywords:** Intimate partner violence, Regions, Nigeria

Link to presentation assessment form: [shorturl.at/muTWZ](https://shorturl.at/muTWZ)

# **Women in Firm Upper Echelons and Innovation: Does International Aid Matter?**

**Ijeoma Priscilla Ugwuanyi** (ijeomachima1212@gmail.com)

Department of Management, College of Business, City University of Hong Kong,  
Hong Kong SAR, China.

Women still occupy few positions in organizations. In 2014, only about 12.9% were in top management across the world (credit Suisse, 2014). There have also been calls to examine the business case for women in top management. Specifically, do women in the upper echelons (female firm owners and females in top management) affect performance of firms? The answer to this question has been mixed, some studies have found that there is a positive relationship between women in the upper echelons and firm performance while others have found a negative relationship. Hence, there have been calls to examine in what circumstance women in the upper echelons affects firm performance and when it does not.

To contribute to this ongoing conversation, I ask the question: How does women in the upper echelons affect firm product and process innovation? Secondly, how does international aid affect the relationship between women in the upper echelons and firm product and process innovation? I introduce international aid as a moderator to the women in the upper echelons- firm product and process innovation relationship because, developing countries have witnessed several donations to aid women equality agenda and other related women development programmes and to help realize the sustainable development goal 5. It would be interesting to explore how these activities in the third sector affects the business case for women in the upper echelons. Data will be collated from publicly available databases, and analysed accordingly.

## **Sample Hypothesis:**

H1a: Female firm ownership is positively related to firm product innovation

H1b: Female firm ownership is positively related to firm process innovation

H2a: Female in top management is positively related to firm product innovation

H2b: Female in top management is positively related firm process innovation

H3a: The relationship between female firm ownership and firm product innovation is positively moderated by international aid, where the relationship between female firm ownership and innovation is stronger for countries with higher international aid.

H3b: The relationship between female firm ownership and firm process innovation is positively moderated by international aid

H4a: The relationship between female in top management and firm product innovation is positively moderated by international aid

H4b: The relationship between female in top management and firm process innovation is positively moderated by international aid.

**Keywords:** Upper Echelons; Women; Innovation; International Aid.

Link to presentation assessment form: [shorturl.at/1wBD8](http://shorturl.at/1wBD8)

# **Digital Media vs Mainstream Media: Influence of Media Exposure and Information Preference on Perceptions of Media Credibility**

**Mistura Salaudeen** (18481264@life.hkbu.edu.hk)  
Hong Kong Baptist University, Hong Kong SAR, China.

The advent of internet and the proliferation of new media technologies have caused a paradigm shift in the practice of journalism worldwide. Citizens who were solely recipients of information transmitted exclusively by the mainstream media, have themselves, become active creators and disseminators of media contents. With the limitless amount of information churned out daily by both mainstream and digital media, and the unprecedented rise in misinformation, fake news and partisan reporting in the media sphere, there are growing skepticisms among Nigerian media audience about the authenticity and reliability of these information and the media platforms through which they are disseminated, which begs the questions; how credible are mainstream media and digital media to Nigerians? What are the influences behind audience's uncertainties about the credibility of mainstream and digital media? Based on the theory of Selective Exposure and McLuhan's notion of Medium is the Message, this study examined the extent to which media exposure pattern and preferences for specific media contents influence perceptions about the credibility of mainstream and digital media. On the media consumption level, we constructed a scale ranging from avid users to occasional users. On the perceptual level, we adopted Gaziano-McGrath's credibility scale as dimensions to measure audience credibility assessment. An integration of quantitative (survey) and qualitative (focus group discussions) research approaches was adopted to provide in-depth understanding of the possible predictive relationship between media exposure, information preference and perceived media credibility. Using cluster probability sampling technique, 240 respondents were selected to participate in the survey, while 24 participants were purposively selected to participate in 4 focus group discussion sessions. Analysis of both quantitative and qualitative data reveal several interesting findings. First, results showed that although digital media platforms are assessed more frequently than mainstream media, information on digital media are rated as less credible than information on mainstream media, which was evaluated as moderately credible. Second, findings showed that news is the most preferred information on mainstream media, while entertainment is most preferred on digital media platforms. Further analysis revealed a significant positive correlation between exposure to

mainstream media and perceived mainstream media credibility, however, a significant negative linkage between exposure to digital media and perceived digital media credibility was observed. Insight into this relationship was provided by the FGD data as thematic analysis revealed that the frequency of mainstream and digital media usage increased awareness about the nature and structure of both media platforms which contributed to the way both platforms were perceived. Findings of this research further revealed that respondents' information preferences on both mainstream media and digital media have predictive influences on the way both media platforms are evaluated. Thus, this research arrives at two significant conclusions; first, audience are generally skeptical about credibility of Nigerian mass media as exemplified by the overall mediocre ratings. Second, audience credibility judgements, initiated by frequent exposure and choice of content consumption, are grounded by the understanding of the characteristics of media platforms. Theoretical and empirical implications are discussed.

**Keywords:** Digital/Mainstream Media, Citizen/Mainstream Journalism, Media Exposure, Information Preference, Media Credibility.

Link to presentation assessment form: [shorturl.at/fjoI8](http://shorturl.at/fjoI8)

## **Session 3: Material Science**

### **Welcome Address**

Distinguished members, guests, ladies, and gentlemen,

I welcome you all to this session on “Material Science”. We would have two presenters who would focus their talks on corrosion control and solar cell technology. The first speaker, Olugbade T. O, from the Department of Mechanical Engineering of the City University of Hong Kong, is an expert in surface engineering of mechanical systems to reduce or eliminate corrosion, and he will walk us through his novel method of corrosion control. Meanwhile, the second speaker, Uyanga K.A., also from the City University of Hong Kong in Energy Harvesting and Wearable Energy Technologies, School of Energy and Environment, is an expert in energy conversion technologies. Today, she will be unveiling her latest technology discovery, which is centred on a new type of solar cell system called Organic Solar Cell Technology.

Each of the speakers will spend 7 min to present their findings and another 3 min for question and answer (Q&A). The Q&A session will be solely directed by the session chair to ensure orderliness. Therefore, we would like all participants to fill out the assessment/evaluation forms as a way of giving quality feedback to the presenters as well as point out measures for future improvement. At the end of the presentation, we will be vested with the latest technology in corrosion control, which is highly needed in our oil and gas industries, and the knowledge gained from the solar cell technology will help us to advise our government on the need to diversify our power sector. Of course, we all hope to contribute to the building of our dear nation via the knowledge that we are currently acquiring from our individual research. Use the link provided at the bottom of the abstract should you have any comments. Be attentive while we kick off with the presentations.

Thank you!

**Iwe Idorenyin Asuquo (Session Chair),**

Department of Mechanical and Aerospace Engineering,  
The Hong Kong University of Science and Technology.

# Effect of post annealing on performance of ZnO/P3HT:PCBM based inverted geometry organic solar cell

K. A. Uyanga<sup>\*#1,2</sup> S. A. Kareem<sup>2</sup>, and S. E. Ogbeide<sup>3</sup>

<sup>1</sup>Energy Harvesting and Wearable Energy Technologies, School of Energy and Environment, City University of Hong Kong, Hong Kong SAR, China.

<sup>2</sup>Chemical Engineering Department, School of Engineering and Engineering Technology, Modibbo Adama University of Technology, Yola, Nigeria.

<sup>3</sup>Chemical Engineering Department, University of Benin, Benin City, Nigeria.

\*Corresponding author and Presenter: [mkauyanga2-c@my.cityu.edu.hk](mailto:mkauyanga2-c@my.cityu.edu.hk) |

The stability of organic solar cells is vital to enhance cell performance and scalability. Herein, the effect of post annealing on cell performance of a blend of poly (3-hexylthiophene) (P3HT) and [6, 6]-phenyl (C61) butyric acid methyl ether (PCBM) active layer built on zinc oxide (ZnO) was studied. Four inverted geometry organic solar cells were fabricated based on 1:1 ratio of P3HT to PCBM and subjected to post annealing at 32, 120, 130 and 140 °C. The glass/ITO/ZnO/P3HT:PCBM/PEDOT:PSS/Au devices were characterized with a Keithley 2400 series sourcemeter and a multimeter. Also, four reference cells with structure soda lime glass/ZnO/P3HT:PCBM were fabricated and annealed at 32, 120, 130 and 140 °C. It was found that optimum post annealing temperature is 130 °C at which sample CITO/ZnO exhibited best cell performance with power conversion efficiency (PCE) equals 3.308%. The results also showed that annealing of the active layer improves cell morphology, FF, and PCE. And, UV-vis absorption analysis confirmed that increasing annealing temperature of the active layer widens absorption spectra of the fabricated devices. Absorption enhancement by post annealing improves cell performance.

**Keywords:** power conversion efficiency; active layer; absorption; zinc oxide; bulk heterojunction

Link to presentation assessment form: [shorturl.at/kDNVZ](http://shorturl.at/kDNVZ)

# Passivation Behaviour and Corrosion Properties of Surface Mechanically Treated 17-4 PH Stainless Steel

**Temitope Olugbade** (tolugbade2-c@my.cityu.edu.hk)

Department of Mechanical Engineering, City University of Hong Kong,  
Hong Kong SAR, China.

The existence and availability of nanostructured 17-4 PH steel (SS17-4PH) with enhanced corrosion and mechanical properties has been the interest of many corrosion experts. However, this material often experience failure under aggressive corrosive environment. The present study investigated the passivation behaviour and corrosion properties of nanostructured SS17-4PH induced by surface mechanical attrition treatment (SMAT) technique. The electrochemical properties were investigated via potentiodynamic polarization in 3.5 wt.% NaCl solution. The nanostructured and passivation layers were characterized by transmission electron microscopy (TEM), X-ray photo spectroscopy (XPS), and atom probe spectroscopy (APT). A significant reduction in the corrosion current density was observed for the sample subjected to SMAT and annealing treatments. This could be attributed to the formation of a compact protective passive film on the sample surface. The APT characterization revealed the presence of high-density Cu-rich precipitates in the SS17-4PH sample with observable elemental segregation, indicating an uneven distribution of elements. The present study will find applications in most manufacturing industries where high corrosion resistance is of utmost importance.

**Keywords:** Polarization; surface treatment; electrode potential; current density; annealing.

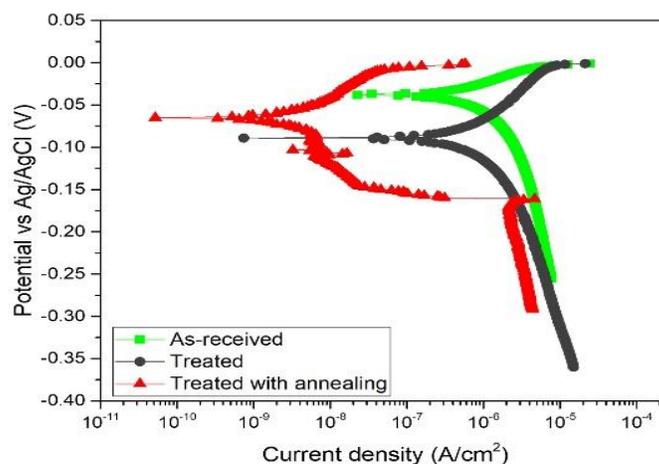


Figure 1. Polarization curves for the as-received and treated SS17-4PH samples.

Link to presentation assessment form: [shorturl.at/fnyV6](http://shorturl.at/fnyV6)

## **Session 4: Law and Commerce**

### **Welcome Address**

The current global challenge is centred on law and commerce with evidence of different foreign policies, trade deals and sanctions, tariff reduction and increase charges that create world-wide concerns for security, health and urban livelihoods. This session discusses the essential parts of human existence from law and commerce perspectives with three exciting topics which includes:

1. Trade Liberalization and State Capitalism: Assessing the Effect of Trade Shock on Workers' Welfare (Presenter: C. I. Onwachukwu)
2. Appointment Scheduling for Physician and Nurse Practitioner Providers' in Outpatient Clinic (Presenter: E.S. Taiwo)
3. R&D, Innovation and Patent Law- Balancing Rights and Obligations (Presenter: A.A. Tolulope)

This session is relevant to you either as an employer or employee, physician or patient and as a researcher or a practitioner because it provides knowledge that bridges the significant gap in law and commerce. The first research distinguished between the state-owned enterprises (SOEs) and the private-owned enterprises (POEs) in Russia. The study estimates the causal relationship that exists between SOEs and POEs by investigating the exogenous reduction in industry tariff as a result of Russia's accessions to the World Trade Organisation. The second research argued based on its findings that the deployment of nurse practitioners (NPs) as independent providers leads to increase patient's access and maximal utilization of physician's capacity. The third study identified the strength and weakness of the current R&D, innovation and patent system, and raised the concern that the system contributes more as a hindrance than advancing economic and technological development. Thus, the research appraised the international regime for patent protection with particular emphasis on the World Trade Organisation.

Speakers have a presentation time of 7 minutes and Q&A sessions of 3mins. The audience are highly encouraged to use the link at the bottom of the each abstracts to provide their comments. Based on the different significant knowledge presented in this section, as a participant, you will be presented with cognitive (theory and practice) relationships that exists between law (local and foreign policies) and commerce (vocation, trade, skills and occupation) in our everyday activities.

### **Dr Soyinka Oluwole (Session Chair)**

Department of Urban Planning and Design,  
Faculty of Architecture,  
The University of Hong Kong.

# Trade Liberalization and State Capitalism: Assessing the Effect of Trade Shock on Workers' Welfare

C. I. Onwachukwu\*<sup>1</sup> and I. K. Yan<sup>1</sup>

<sup>1</sup>Department of Economics and Finance, City University of Hong Kong, Hong Kong SAR, China

\*Corresponding author: [increase.chinedu@my.cityu.edu.hk](mailto:increase.chinedu@my.cityu.edu.hk)

In recent years, research on trade, employment and labour earning has become progressively popular. In general, studies on the trade-labour market nexus establish the impact of foreign trade on the earnings of workers by looking at the average industry wages of a widely defined group of workers. The main issue that arises here is that by considering average industry wages, it is easy to neglect the firm-specific determinants of wage-fixing. In this study, we investigate the role of the type of employment unit in determining workers' wage and employment in Russia. Specifically, we distinguish between the state-owned enterprises (SOEs) and the privately-owned enterprises (POEs). SOEs undoubtedly play a vital role in the attainment of high economic growth and development, especially in socialist countries. We, therefore, pose the following questions: What inherent characteristics specifically distinguish the SOEs from the POEs? In the presence of trade liberalization, does the strong presence of SOEs in Russia explain the earnings and employment of workers? What mechanisms if any, drive such effect? To answer these questions, we use a rich dataset from the Russian Longitudinal Monitoring Survey (RLMS), which spans between 1994-2018. We estimate a causal relationship by exploiting the exogenous reduction in industry tariff as a result of Russia's accession to the World Trade Organization. Though our analysis only distinguishes between workers in the POEs and the SOEs, we control for firm-level heterogeneities by including numerous firm control variables. Our difference-in-difference estimates revealed that workers in the POEs earn lower gross hourly wages compared to those in the SOEs. Moreover, workers in the POEs have a higher probability of being unemployed relative to their counterparts in the SOEs. Our results point to the crucial role of SOEs in attenuating the adverse effects of trade shock on workers' welfare.

**Keywords:** Trade; State-Owned Enterprises; Privately-Owned Enterprises; Russia

Link to presentation assessment form: [shorturl.at/JKO36](https://shorturl.at/JKO36)

# Appointment Scheduling for Physician and Nurse Practitioner Providers' in Outpatient Clinic

E.S. Taiwo<sup>\*#1</sup>, F.Y. Chen<sup>2</sup> and K.S. Chin<sup>1</sup>

<sup>1</sup>Department of SEEM, City University of Hong Kong, Hong Kong SAR, China.

<sup>2</sup>Department of Management Science, City University of Hong Kong, Hong Kong SAR, China.

\*Corresponding author: estaiwo2-c@my.cityu.edu.hk

In the face of the growing rate of a shortage of physicians in outpatient clinics, nurse practitioners (NPs) are now being hired to complement the system capacity. The NPs can either be deployed as independent providers, assuming the full role of a physician or as intermediates, assisting the physician(s). An empirical study shows that there exists no significant difference in the standards of care offered by the physicians and the NPs. However, patients' perception that the standard of care the NPs offer is low often leads to their reluctance to be served by them. Hence, an appointment scheduling decision is necessitated, which considers the patient's reluctance and no-show behavior, to ensure a balance in system utilization and patients' access to care. In this paper, a proposed stochastic optimization model, based on the transient state analysis of queue, is presented to determine the optimal appointment scheduling decision that minimizes the weighted sum of patient's waiting time, physician and NP's idleness, and physician's overtime. Theoretical results show that the objective function possesses the multimodular structure and the optimal solution possesses a structure that allows for the refinement of the search space. Therefore, a heuristic, called the "cut-off variable neighbourhood algorithm" is proposed to solve this problem. Numerical results reveal that the deployment of NPs as independent providers leads to increased patient's access and maximal utilization of physicians' capacity. However, the decision-maker must be careful to consider the uncertainty in the patient's willingness to see NPs.

**Keywords:** Appointment scheduling; outpatient clinic; multimodularity; optimization.

Link to presentation assessment form: [shorturl.at/nrBL2](http://shorturl.at/nrBL2)

# **R&D, Innovation and Patent Law- Balancing Rights and Obligations**

**Tolulope Anthony Adekola** (atadekola2-c@my.cityu.edu.hk),  
School of Law, City University of Hong Kong, Hong Kong SAR, China.

One of the theoretical justification for patents is that they stimulate economic and technological development and promote competition by creating a financial motivation for invention in return for the disclosure of the invention to the public. Although the potential of the patent system has been widely recognized in the context of dynamic innovation activities, some critics have claimed that the current patent system hinders R&D and access to technological innovation, particularly in less developed countries. Nowhere have these concerns been more acute than in the pharmaceutical sector. Africa suffers the highest disease burden in the world, and the lack of access to medicines further aggravates the African public health crisis. Significant commentaries and analyses have been presented on how the international legal regime for patent protection exacerbates the problem of access to affordable pharmaceuticals. This paper examines the question as to whether the international regime for patent protection, with particular emphasis on the World Trade Organizations' Agreement on Trade Aspects of Intellectual Property Rights (TRIPS), has sufficient flexibilities for advancing access to medicines in less developed countries. While the paper finds that the international legal regime for patent protection has indeed made access to medicines extremely onerous in Africa, it recommends that trade liberalisation and regional integration can play crucial roles in enhancing the use of TRIPS flexibilities, local pharmaceutical manufacturing and better access to medicines in Africa.

**Keywords:** Patent Law; Access to Medicines; Pharmaceutical innovation.

Link to presentation assessment form: [shorturl.at/pAQWY](http://shorturl.at/pAQWY)

## Closing Remarks

### **Esteemed Scholars,**

It is a bittersweet experience to come to the end of such a productive discussion finally. As today's main theme is "Innovations in Arts, Science and Technology", by listening to the excellent presentations and discussions, I am sure we have gained some perspectives on interdisciplinary research outside our various fields. I would like to thank all participants, invited presenters, presenters, reviewers, and the session chairs for your valuable efforts. It is evident from the presentations that you have worked hard to make worthwhile contributions, and you succeeded! I also appreciate the Research Forum Committee for a job well done. For the first time, we have this many contributors. Many thanks to members of the Executive Committee, too, for their support. Lastly, I shall give a brief highlight of the discussions over the four plenary sessions.

Dr. Akinsanola proposed an index, which can be used to understand the variations and intensity of summer rainfall in West Africa, based on regions of easterly streams and westerly winds. Also, instead of geological mapping and geophysical studies, Mr. Adeoti proposed a new, more accurate approach of defining the width of shear zones by monitoring chemical changes in rock materials. Good knowledge of locations rich in mineral or prone to geo-environmental hazards during mineral explorations helps in safety and proper planning.

In the second session, Mr. Ola examined the scourge of domestic violence against women in Nigeria, as well as its associated factors and perceptions across the geopolitical zones. The study showed the prominent effect of enlightenment, as the acceptance declined by almost 20% within 10 years, although there is a slight increase in victimization. Mrs. Ugwuanyi discussed extensively on the perceived mixed impact of female leadership on firms' performance and innovation. The moderator role played by international aid in the female executives–firm product–innovation relationship, especially in developing countries, was brought to the foreground. Finally, Ms. Salaudeen critically examined the changing roles in the Nigerian information space, as well as the effects on the perception of media credibility. By contrasting the fast-rising digital media to mainstream media, the author analyzed how media exposure and information preference shape the perception of the masses on information and their sources.

In the materials science session, Ms. Uyanga examined the plausibility of enhancing the stability of organic solar cells with post-annealing. Analysis results demonstrate that increasing the annealing temperature widens the absorption spectra of an active layer, which leads to

improvements in the performance, morphology, and scalability of solar cells. Dr. Olugbade presented a methodology for improving the anti-corrosion properties of 17-4 stainless steel. It was demonstrated that the combination of surface mechanical attrition and annealing treatments creates a protective film on sample surfaces, which bolsters corrosion resistance.

In the final session, Mr. Onwachukwu challenged the widespread usage of the average industry wages in assessing the impact of foreign trade on labor earnings. To understand the role of enterprises in attenuating the effects of trade shock on workers' welfare, the influence of employment unit types on wages and unemployment in Russia was investigated. Mr. Taiwo addressed the problem of physicians' appointment scheduling by using a stochastic optimization model. A novel heuristic algorithm could find a buffer zone between the deployment of nurse practitioners and patients' skepticism to seeing nurse practitioners. Finally, Mr. Adekola provided some critical insight into the double-edged nature of patent laws, especially in the pharmaceutical industry. The author offered a perceptive contribution to the ongoing debate on whether international innovation laws are unsympathetic to public interests.

I am delighted that you could all attend this year's research forum. I hope today's session has bridged some gaps for research interactions and collaborations among us. Through knowledge-sharing and implementations, we can drive the change that Nigeria deserves.

Again, on behalf of the organizers, thank you all for participating.

**Mujib ADEAGBO**

**Secretary, ANSHK 2019/20 Executive Committee**