



The **10th** INTERNATIONAL  
CONFERENCE ON APPROPRIATE TECHNOLOGY

# 10th ICAT Program

22 – 25 November 2022  
Khartoum, Sudan

**Enhancing Peace and Governance through Appropriate  
Technology:** Reimagining Sustainable Community Wellbeing  
in an Era of Global Climate Change



Main host



Co-host



@10thICAT

# 10<sup>th</sup> ICAT PROGRAM | 22 – 25 NOVEMBER 2022

DAY 1	TUESDAY 22 NOVEMBER [Venue : Faculty of Architecture, University of Khartoum]			
Time (Central Africa Time)	ROOM A	ROOM B	ROOM C	ROOM D
7:30 AM *Registration				
8 - 9	INVITED WORKSHOP (VII): Water and Sanitation	INVITED WORKSHOP (II): Governance   Policy, Standards, and Ethics	INVITED WORKSHOP (III): Environment, Agriculture, and Ecovillages	INVITED WORKSHOP (IV): Manufacturing
9 - 10 *Tea/Coffee				
10 - 11	INVITED WORKSHOP (VI): Energy and Materials			
11 - 12 PM				
12 - 1 *Lunch Break				
1 - 2	INVITED WORKSHOP (V): Education, Knowledge, and Technology Transfer	INVITED WORKSHOP (I): Governance   Policy, Standards, and Ethics		
2 - 3				
3 - 4 *Tea/Coffee	WELCOME RECEPTION			
4 - 5	KEYNOTE TALK (I)			
5 - 6	KEYNOTE TALK (II)			
DAY 2	WEDNESDAY 23 NOVEMBER [Venue : Ministry of Higher Education and Scientific Research, Khartoum]			
Time (CAT)	ROOM A	ROOM B	ROOM C	ROOM D
7:30 AM *Registration				
8 - 9	OPENING SESSION			
9 - 10 *Tea/Coffee	KEYNOTE TALK (3)			
10 - 11		PAPER SESSION: Climate Change	PAPER SESSION: Education, Knowledge, and Technology Transfer (I)	PAPER SESSION: Health
11 - 12 PM	PAPER SESSION: Sustainability, Social Inequality, and Human Wellbeing   Green Economy and Innovation			PAPER SESSION: Water and Sanitation
12 - 1 *Lunch Break				
1 - 2	PANEL: BEST PAPERS (I)			
2 - 3	KEYNOTE TALK (IV)			
3 - 4 *Tea/Coffee	PAPER SESSION: Construction and Infrastructure   Cities and Spaces (I)	TECHATHON	WORKSHOP: Education, Knowledge, and Technology Transfer (I)	WORKSHOP: Governance   Policy, Standards, and Ethics (I)
4 - 5				
5 - 6				
DAY 3	THURSDAY 24 NOVEMBER [Venue : Ministry of Higher Education and Scientific Research, Khartoum]			
Time (CAT)	ROOM A	ROOM B	ROOM C	ROOM D
7:30 AM *Registration				
8 - 9	INAT MEETING			
9 - 10 *Tea/Coffee	KEYNOTE TALK (V)			
10 - 11	PAPER SESSION: Environment, Agriculture, and Ecovillages	PAPER SESSION: Construction and Infrastructure   Cities and Spaces (II)	PAPER SESSION: Education, Knowledge, and Technology Transfer (II)	PAPER SESSION: Peace, Security and Safety
11 - 12 PM				PAPER SESSION: Governance   Policy, Standards, and Ethics
12 - 1 *Lunch Break				
1 - 2	PANEL: BEST PAPERS (II)			
2 - 3	KEYNOTE TALK (VI)			
3 - 4 *Tea/Coffee	FORUM: Women in STEM and Appropriate Technology	PAPER SESSION: Energy and Materials	WORKSHOP: Education, Knowledge, and Technology Transfer (II)	WORKSHOP: Governance   Policy, Standards, and Ethics (II)
4 - 5				
5 - 6	PAPER SESSION: Technology R&D   Services Industry			
6 - 7	CONFERENCE			
7 - 8	DINNER			
DAY 4	FRIDAY 25 NOVEMBER [Venue : Ministry of Higher Education and Scientific Research, Khartoum]			
Time (CAT)	ROOM A	ROOM B	ROOM C	ROOM D
7:30 AM *Registration				
8 - 9				
9 - 10 *Tea/Coffee	KEYNOTE TALK (VII)			
10 - 11	PANEL: Knowledge Production and Innovation in Africa			
11 - 12 PM				
12 - 1	LUNCH & PRAYERS BREAK			
1 - 2				
2 - 3	SCHOOL STUDENTS' SESSION	TECHFAIR SESSION	POSTER SESSION	
3 - 4 *Tea/Coffee				
4 - 5	KEYNOTE TALK (VIII)			
5 - 6	CLOSING SESSION			

**DAY 1: Tuesday 22 November [Venue: Faculty of Architecture, University of Khartoum]**

TIME (Central Africa Time)	ROOM A	ROOM B	ROOM C	ROOM D
8 – 9 AM	<p><b>INVITED WORKSHOP (VII): Water and Sanitation</b></p> <p><b>WASH (WATER, SANITATION AND HYGIENE) IN ELFASHER</b></p> <p><i>Organizers: Mustafa Omer Mohammed, Mehad Khalil Adam Mohammed, Mayada Yousif Ibrahim Mansur, Mustafa Abdoalrhman Mohamed, and Saif Elislam Adam Musa Abdelkareem</i></p>	<p><b>INVITED WORKSHOP (II): Governance   Policy, Standards, and Ethics</b></p> <p><b>WORKING WITH UNDERREPRESENTED GROUPS TO INFORM TECHNOLOGY GOVERNANCE &amp; POLICYMAKING</b></p> <p><i>Organizer: Lassana Magassa</i></p>	<p><b>INVITED WORKSHOP (III): Environment, Agriculture, and Ecovillages</b></p> <p><b>ECOLOGICAL APPROACHES TO FOOD SECURITY AND PEACE IN THE SAHEL FROM THE SMALL HOLDER FARMER UP</b></p> <p><i>Organizers: Brian Stephenson, Mariam Olorundare, Marwan Awad, and Enayat Mohaker</i></p>	<p><b>INVITED WORKSHOP (IV): Manufacturing</b></p> <p><b>3D PRINTING FUNDAMENTALS: GETTING STARTED ON PRINTER CONFIGURATION, TROUBLESHOOTING, AND CAD FILE TO OBJECT STEPS</b></p> <p><i>Organizers: Jephias Gwamuri and William Goriwondo</i></p>
9 - 10 *Tea/Coffee				
10 - 11	<p><b>INVITED WORKSHOP (VI): Energy and Materials</b></p> <p><b>COLLABORATIVE DESIGN AND CONSTRUCTION WORKSHOPS BUILD LOCAL CAPACITY IN SOLAR OVENS AND SMALL WIND TURBINES ON SUMBA ISLAND, INDONESIA - USEFUL OUTCOMES FOR AUTONOMOUS RENEWABLE ENERGY GENERATION?</b></p> <p><i>Organizer: Tim Frodsham</i></p>			
11 - 12 PM				
12 – 1 *Lunch				

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<b>TIME</b> (Central Africa Time)	<b>ROOM A</b>	<b>ROOM B</b>	<b>ROOM C</b>	<b>ROOM D</b>
<b>1 - 2</b>	<b>INVITED WORKSHOP (V): Education, Knowledge, and Technology Transfer</b>  <b>SUSTAINABLE COMPUTING USING THE RASPBERRY PI PLATFORM</b>  <i>Organizers: Jesse Bemley, Bryan Bemley, Anthony Adedoyin, and Olaoluwa Adewoye</i>	<b>INVITED WORKSHOP (I): Governance   Policy, Standards, and Ethics</b>  <b>A GLOBAL ETHICS FOR APPROPRIATE TECHNOLOGY</b>  <i>Organizers: Charles Verharen, John Tharakan, Gada Kadoda, George Middendorf, and David Schwartzman</i>		
<b>2 - 3</b>				
<b>3 - 4</b>	<b>WELCOME RECEPTION</b> <i>Akram El Khalifa and Amel Bakhiet</i> [Featuring <i>Lyrical Poetry and Folk Dances</i> by Students from Faculty of Education (University of Khartoum) Schools]			
<b>4 - 5</b>	<b>KEYNOTE TALK (I)</b>  <b>THE DELUSION OF (NEUTRALITY OF TECHNOLOGY): A CRITIQUE FROM A REGIONAL PERSPECTIVE</b>  <i>Speaker: Mohamed Abdelrahman Hassan</i>  <i>Moderator: Aya Aziz</i>			
<b>5 – 6 PM</b>	<b>KEYNOTE TALK (II)</b>  <b>TOWARDS A MORE CIRCULAR ECONOMY: RECYCLING ORGANIC WASTES INTO BIOGAS AND FERTILIZER</b>  <i>Speaker: Myron Williams</i>  <i>Moderator: John Trimble</i>			

**DAY 2: Wednesday 23 November [Venue: Ministry of Higher Education and Scientific Research, Khartoum]**

TIME (Central Africa Time)	ROOM A	ROOM B	ROOM C	ROOM D
8 – 9 AM	<p><b>OPENING SESSION</b></p> <p><i>Conference Chair: Gada Kadoda,</i> International Network on Appropriate Technology</p> <p><i>Chair and Co- chair, Local Organizing Committee:</i></p> <ul style="list-style-type: none"> <li>• Akram El Khalifa, University of Khartoum</li> <li>• Amel Bakhiet, Sudan University of Science and Technology</li> </ul> <p><i>Guest Speakers:</i></p> <ul style="list-style-type: none"> <li>• President, International Network on Appropriate Technology</li> <li>• Vice Chancellor, University of Khartoum</li> <li>• Vice Chancellor, Sudan University of Science and Technology</li> </ul> <p><i>Sponsors:</i></p> <ul style="list-style-type: none"> <li>• Ministry of Higher Education and Scientific Research</li> <li>• Gibela Research Chair</li> </ul>			
9 - 10 *Tea/Coffee	<p><b>KEYNOTE TALK (III)</b></p> <p><b>EVOLUTION OF SOLAR CONCENTRATOR TECHNOLOGY IN INDIA FOR THERMAL APPLICATIONS LIKE SOLAR COOKING, COOLING AND POWER GENERATION</b></p> <p><i>Speaker: Deepak Gadhia</i></p> <p><i>Moderator: John Tharakan</i></p>			

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10 - 11		<p><b>PAPER SESSION: Climate Change</b></p> <p><i>Chair: Taurai Mutanda</i></p> <p><b>26: INCREASE ATMOSPHERIC WATER GENERATING EFFICIENCY BY USING THERMOELECTRIC COOLERS CHIP AND ELECTROLYTE LIQUID</b>  <i>Rumaisa Mohey Eldin Abd Elaziz Miki, Tahleel Mahmoud Idrees Abdelhafeez, Mustafa Ibrahim Yousif Ishaq, and Mohamed Ibrahim Salih Fadul</i></p> <p><b>105: MULTIPLE-CRITERIA DECISION ANALYSIS FRAMEWORK FOR WATER INFRASTRUCTURE DEVELOPMENT PRIORITIZATION IN SUDAN</b>  <i>Eiman M. Karar and Bouran Awad Hassan</i></p> <p><b>130: FACTORS AFFECTING SOLAR BOXCOOKER (SBC) TECHNOLOGY ADOPTION IN KHARTOUM STATE, SUDAN</b>  <i>Mawahib E. Ahmed and Nouralla Y. Bakhiet</i></p>	<p><b>PAPER SESSION: Education, Knowledge, and Technology Transfer (I)</b></p> <p><i>Chair: Marwan Adam</i></p> <p><b>20: THE BAREFOOT WAY TOWARD “FREEDOM, PEACE, AND JUSTICE”: A QUIET REVOLUTION</b>  <i>Gada Kadoda</i></p> <p><b>220: AFRICAN ETHICS AND AN IDENTITY FOR GLOBAL SUSTAINABILITY</b>  <i>Enrico J. Wensing and Alexia J. Wensing</i></p> <p><b>72: RE-ENGINEERING ENGINEERING EDUCATION FOR SUSTAINABLE DEVELOPMENT</b>  <i>John Tharakan</i></p> <p><b>161: DEVELOPING RESILIENT COMMUNITIES: THE ROLE OF HIGHER EDUCATION INSTITUTES</b>  <i>Walaa Ahmed and Akram Elkhalfa</i></p>	<p><b>PAPER SESSION: Health</b></p> <p><i>Chair: John Tharakan</i></p> <p><b>12: SIGN LANGUAGE GLOVES (ARABIC SIGN LANGUAGE)</b>  <i>Hamid Mohamed Hamid Mohamed, Mohamed Osama Omer Abuzaid, Tahleel Mahmoud Idrees Abd-Alhafeez, and Amin Galal Elhag Mohamed</i></p> <p><b>151: APPLICABLE INDUSTRY 4.0 – TECHNOLOGIES IN HEALTH 4.0: A REVIEW</b>  <i>Meshack Mazibuko, Lagouge Tartibu, and Robert Mutyavavire</i></p> <p><b>185: USING DATA ANALYTICS TO PREDICT COVID-19 CASES IN SUDAN</b>  <i>Aisha Abdel Aziz Elhussien Ali, Marwa Olaish Ahmed Khalafallah, Rugia Ismail Mohamed Ahmed, and Izzeldin Kamil Amin</i></p> <p><b>191: UNIVERSITY TO INDUSTRY: THE COMMERCIALISATION OF APPROPRIATE MEDICAL DEVICES IN THE SOUTH AFRICAN CONTEXT</b>  <i>Dominic White and Ashton Margarete Moseley</i></p>

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11 – 12 PM	<p><b>PAPER SESSION:</b> Sustainability, Social Inequality, and Human Wellbeing   Green Economy and Innovation</p> <p><i>Chair: Marcel J. Castro Sitiriche</i></p> <p><b>66: INTEGRATED DEPRIVATION AREA MAPPING SYSTEM FOR DISPLACEMENT DURABLE SOLUTIONS AND SOCIO-ECONOMIC RECONSTRUCTION, SUDAN</b> <i>Nuha Eltinay, Monika Kuffer, Caroline Margaux Gevaert, Inas M.M. Ali, Charlotte Flasse4, Cheruiyot Onyambu, Maysoon Badi, Asgad Gummah, Kumi Julia, Ibrahim Kushieb, Wafa Sakhi, Taha Elzaki, Mosub Abdallah8, Marwa Ali, Mustafa Hamza, and Fatima Ahmed</i></p> <p><b>162: APPROPRIATE METHODS TO ENSURE HOUSING PROVISION FOR THE LOW-INCOME GROUPS IN KHARTOUM, SUDAN</b> <i>Shaza Khatab and Mustafa, A/Bagi</i></p>	<p><b>186: ECOVILLAGE MODELS AS SOLUTIONS TO COMMUNITY VULNERABILITY TO HUNGER, DISASTERS AND DEVELOPMENT CHALLENGES IN AFRICA</b> <i>George Atisa, Sharon McIntyre, and Cecilio Ortiz-Garcia</i></p> <p><b>198: USING GEOSPATIAL TECHNIQUES TO ASSESS LANDUSE CHANGE DUE TO FLOOD HAZARD IN KOSTI LOCALITY, SUDAN</b> <i>Sona Mohammed Fadoul Mohammed</i></p> <p><b>213: BUILDING THE ELECTRICITY SECTOR IN SUDAN: ADDRESSING FAULT SCENARIOS IN SMART GRID</b> <i>Nahla Mustafa Ali</i></p>	<p><b>192: EQUIPPING FUTURE DESIGN ENTREPRENEURS WITH APPROPRIATE SMALL-BATCH MANUFACTURING TECHNOLOGIES</b> <i>Oratile R. Mokgatla and Daniel Carstens</i></p> <p><b>195: DETERMINANTS OF SUSTAINABLE COMPETITIVENESS IN AFRICA: ANALYSIS WITH THE OPEN QUINTUPLE HELIX MODEL</b> <i>Bernadin Géraud Comlan Ahodode</i></p> <p><b>196: UNIVERSITY-INDUSTRY COLLABORATION, LEARNING, AND INNOVATION IN AFRICA</b> <i>Bernadin Géraud Comlan Ahodode and Joel Stephan Tagne</i></p>	<p><b>PAPER SESSION: Water and Sanitation</b></p> <p><i>Chair: Sahl Yasin</i></p> <p><b>5: FLUORIDE REMOVAL FROM GROUND WATER IN THE EAST NILE AREA (SUDAN) USING LOCALLY AVAILABLE CHARCOAL</b> <i>Motwkel Mahmoud Ibraheem Alhaj and Bashir Mohammed Elhassan</i></p> <p><b>157: WATER QUALITY MODEL FOR BLUENILE KHARTOUM STATE- SUDAN USING HEC-RAS APPLICATION</b> <i>Alwaleed Seif Aldeen Khider, Khalid Altegani Khalid Abdallah, Mohamed Elfatih Mohamed, and Michael Magdy Mounir Kamel</i></p> <p><b>93: MODIFIED CERAMIC POT FOR WATER PURIFICATION METHODS IN RURAL AREAS IN SUDAN</b> <i>Sahl Yasin, Noha Almahi, Gameraldawola Mustfa, Haider Abaker, Rabei Suliman</i></p>
12 – 1 *Lunch				



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<b>1 – 2</b>	<b>PANEL: BEST PAPERS (I)</b> <ul style="list-style-type: none"> <li>• Cities and Space &amp; Construction and Infrastructure</li> <li>• Energy and Materials</li> <li>• Health</li> <li>• Peace, Security, and Safety</li> </ul> <i>Moderator: Charles Verharen</i>			
<b>2 – 3</b>	<b>KEYNOTE TALK (IV)</b>  <b>WASTEWATER TREATMENT AS IF PEOPLE MATTERED!</b>  <i>Speaker: Lilia Abron</i>  <i>Moderator: Hattie Carwell</i>			
<b>3 – 4</b> *Tea/Coffee	<b>PAPER SESSION: Construction and Infrastructure   Cities and Space (I)</b>  <i>Chair: Amged O. Abdelatif</i>  <b>53: EXPERIMENTAL ASSESSMENT OF FABRIC-REINFORCED CEMENTITIOUS MORTAR (FRCM) MECHANICAL PERFORMANCES</b> <i>Alaa Mohammed Ali, Marco Di Ludovico, and Costantino Menna</i>  <b>99: UTILIZING OF PLASTIC WASTE INTO MANUFACTURING OF PAVER TILES</b> <i>Ali Hussein M. Ali and Abdelmonim Adam Haroun</i>	<b>TECHATHON</b>  <i>Organizer: Mjumbe Poe</i>	<b>WORKSHOP: Education, Knowledge, and Technology Transfer (I)</b>  <b>10: PLASTIC-FREE PERIOD: MENSTRUAL CUPS</b>  <i>Organizers: Marwa Tageldin, Muna Abdelrahman, Maisaa Dean, and Aamir Dean</i>	<b>WORKSHOP: Governance   Policy, Standards, and Ethics (I)</b>  <b>169: OPEN DATA SHARING PROTOCOL: A SUDANESE EXPERIMENT</b>  <i>Organizers: Safa Suliman, Marwan Adam, Rofaida El Zubair, Gada Kadoda</i>
<b>4 - 5</b>				



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	<p><b>167: THE EFFECT OF USING CEMENT DUST ON THE PROPERTIES OF MORTAR AND CONCRETE</b>  <i>Ali Hussein M. Ali and Adel Salah A. Alrahim</i></p> <p><b>199: DESIGN OF PASSENGER CARS ASSEMBLY FACTORY IN NORTH OF KHARTOUM USING BUILDING INFORMATION MODELLING (BIM)</b>  <i>Mohamed Elrashid Mohamed, Ahmed Mohamed Doul, Mohamed Yousif Mudawi, Naji Mohammed Othman, Mohammed Tagelsir Abdelsalam, and Aziz Fadoul</i></p> <p><b>23: ARTIFICIAL INTELLIGENCE APPROACH FOR PREDICTING THE COMPRESSIVE STRENGTH OF CONCRETE MIXTURE</b>  <i>Alziber Mohammed, Ayman Salah, Moayad Jamal, Omer Ali, and Yousif Hummaida Ahmed</i></p>			
5 – 6 PM				

**DAY 3: Thursday 24 November [Venue: Ministry of Higher Education and Scientific Research, Khartoum]**

TIME (Central Africa Time)	ROOM A	ROOM B	ROOM C	ROOM D
8 – 9 AM	<p><b>MEETING: INTERNATIONAL NETWORK ON APPROPRIATE TECHNOLOGY (INAT)</b></p> <p><i>Chair: John Trimble</i></p>			
9 - 10 *Tea/Coffee	<p><b>KEYNOTE TALK (V)</b></p> <p><b>APPROPRIATE SCALES OF ARCHITECTURE FOR THE AFRICAN ANTHROPOCENE</b></p> <p><i>Speaker: Sushma Patel</i></p> <p><i>Moderator: Akram El Khalifa</i></p>			
10 - 11	<p><b>PAPER SESSION: Environment, Agriculture, and Ecovillages</b></p> <p><i>Chair: Brian Stephenson</i></p> <p><b>28: MUTUAL RELATIONSHIP BETWEEN LAND DEGRADATION AND POVERTY IN SUDAN</b> <i>Mohammed Abdalla Elsheikh and Eltayeb Suleiman Babikir</i></p> <p><b>29: THE SMART JUBRAKA: A SUSTAINABLE HOME GARDEN FOR FOOD SECURITY</b> <i>Enayat Salih, Marwan Adam and Fatima Ali</i></p>	<p><b>PAPER SESSION: Construction and Infrastructure   Cities and Space (II)</b></p> <p><i>Chair: Aamir Dean</i></p> <p><b>110: PREDICTION OF SOIL'S COMPACTION CHARACTERISTICS USING ARTIFICIAL NEURAL NETWORKS (ANNs)</b> <i>Mohamed Alhag Emad Mohamed, Alzobair Mohammed, and Ahmed Mohammed Elsharief</i></p>	<p><b>PAPER SESSION: Education, Knowledge, and Technology Transfer (II)</b></p> <p><i>Chair: John Trimble</i></p> <p><b>208: FOOD WASTE, NOT IN GOOD TASTE: AN INVESTIGATION OF THE CAUSES OF FOOD WASTE IN THE NATIONAL SCHOOL NUTRITION PROGRAMME</b> <i>Tressilia Mumba, and Hema Kesa</i></p> <p><b>152: COVID-RESPONSIVE STUDIO MANAGEMENT SYSTEMS IN ARCHITECTURAL EDUCATION: THE CASE OF UNIVERSITY OF KHARTOUM</b> <i>Duaa Abdalhaleem, Akram Elkhalifa, and Malathe Hamid</i></p>	<p><b>PAPER SESSION: Peace, Security, and Safety</b></p> <p><i>Chair: Charles Verharen</i></p> <p><b>17: KNOWLEDGE NETWORKING FOR EAST AFRICA CSO NETWORK FOR PEACEBUILDING AND CONFLICT PREVENTION (ECONET)</b> <i>Marwan Adam, Dalia Eissa, and Gada Kadoda</i></p> <p><b>197: REGIONAL SPATIAL STRATEGY AS A TECHNICAL TOOL FOR PEACE CONSOLIDATION IN SUDAN</b> <i>Salah Mahmoud Osman</i></p>

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	<p><b>33: ELECTROCOAGULATION OF CATTLE MANURE WASTEWATER</b>  <i>Bianca Bailey, Rabin Bhattarai, Tony Grift, and Sharvi Goyal</i></p>	<p><b>120: REMARKS ON IDENTIFICATION AND APPROACHES OF PROTOTYPE BUILDINGS IN SUDAN_ THE CASE OF PUBLIC SERVICES BUILDINGS</b>  <i>Razan Abdelgadir, Rami Zeinelabdein, and Tallal Saeed</i></p>	<p><b>52: CLOUDS OF LIES OBSCURE SUDAN'S SKY: POLITICS OF MISINFORMATION, DISINFORMATION, AND HATE IN TIMES OF TRANSITION</b>  <i>Husam Mahjoub and Marwan Adam</i></p>	<p><b>129: DECENT HOME DESIGN FOR RESETTLEMENT OF WAR DISPLACED IN DARFUR, SUDAN</b>  <i>Fatimah Abubaker</i></p>
11 - 12 PM	<p><b>35: EFFICACY OF CONSTRUCTED WETLAND IN THE IMPROVEMENT OF EFFLUENT FROM SOBA STABILIZATION PONDS, KHARTOUM, SUDAN 2021</b>  <i>Ibrahim Ahmed Suliman Bdal, Babiker Ahmed Babiker, and Aziza abd Elgadir Mohammed Abd Ulla</i></p> <p><b>205: DESIGNING A PORTABLE TREATMENT SYSTEM FOR EQUIDS IN RURAL SOUTH AFRICA IN A POSTHUMAN-CENTRED DESIGN FRAMEWORK</b>  <i>Azél Viljoen and Martin Bolton</i></p>	<p><b>134: SOLVING THE URBAN PROBLEMS FROM WITHIN: THE CASE OF MAYOUP</b>  <i>Mirametta Botrous and Akram Elkhalfifa</i></p> <p><b>206: ACHIEVING RESILIENCE IN COASTAL COMMUNITIES: A CASE STUDY OF JABAL AWLIYA LOCALITY, KHARTOUM-SUDAN</b>  <i>Hanan Alswahli, Samah Tambal, and Mohammed Gismallah</i></p> <p><b>13: THE ROLE OF SUDANESE PRIVATE SECTOR IN PEACEBUILDING IN WASH SECTOR: INITIATION OF INFRASTRUCTURE FOR PEACE PRACTICES</b>  <i>Bouran Awad Hassan</i></p>	<p><b>90: AN ASSESSMENT OF THE EFFECTS OF SOCIAL MEDIA ON LEARNERS AT NUST IN BULAWAYO, ZIMBABWE</b>  <i>Sibangiso Ngwenya and Khesani Richard Chilumani</i></p> <p><b>207: PREDICTION AND ANALYSIS MODEL FOR ACADEMIC SCHOOL PERFORMANCE (SUDANESE PRIMARY SCHOOLS AS CASE STUDY)</b>  <i>Safa Suliman, Asma Idris, Sara Mergani, and Duha Gaafar</i></p> <p><b>190: AN ANALYSIS OF IMPACT OF SEO FOR SUDANESE UNIVERSITIES WEBMETRICS RANKING, CASESTUDY: UNIVERSITY OF KHARTOUM WEBSITES</b>  <i>Nada Ali</i></p>	<p><b>PAPER SESSION: Governance   Policy, Standards, and Ethics</b>   <i>Chair: Charles Verharen</i></p> <p><b>203: A VISION OF LEED-LIKE ETHICAL STANDARDS FOR A GLOBAL CONSORTIUM OF ECOVILLAGES</b>  <i>Charles Verharen, Flordeliz Bugarin, John Tharakan, George Middendorf, David Schwartzman, Peter Schwartzman, Gada Kadoda, Bekele Gutema, and Enrico Wensing</i></p> <p><b>73: SUDAN ICT POLICY PLANNING: CITIZENS CENTRED, MULTI-STAKEHOLDER, AND MCDA FORMULATION FOR ICT POLICY</b>  <i>Marwan Adam and Osama Khair</i></p> <p><b>217: PEOPLE-CENTERED EVALUATION OF INDUSTRIAL POLICIES IN POST REVOLUTION SUDAN 2019-2021</b>  <i>Muzan Alneel</i></p>
12 – 1 *Lunch				

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1 - 2	<p><b>PANEL: BEST PAPERS (II)</b></p> <ul style="list-style-type: none"> <li>• Climate Change</li> <li>• Environment, Agriculture and Ecovillages</li> <li>• Water and Sanitation</li> <li>• Education, Knowledge and Technology Transfer</li> <li>• Governance &amp; Policy, Standards, and Ethics</li> </ul> <p><i>Moderator: Taurai Mutanda</i></p>			
2 - 3	<p><b>KEYNOTE TALK (VI)</b></p> <p><b>NANO-MATERIALS FOR ENERGY APPLICATIONS &amp; WOMEN IN STEM IN SUDAN</b></p> <p><i>Speaker: Nashwa Eassa</i></p> <p><i>Moderator: Amel Bakhiet</i></p>			

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3 - 4 *Tea/Coffee	<p><b>FORUM: WOMEN IN STEM AND APPROPRIATE TECHNOLOGY</b></p> <p><i>Chair: Mariam Abdelghafour</i> Professor, UNESCO Chair of Science, Technology, and I), Sudan University of Science and Technology</p> <p><b>PART I: Presentations (1 hour)</b></p> <p><b>STEM Sudan Projects:</b> <i>Hassan Baba</i> Director, STEM Sudan</p> <p><b>1. Young girls in Scratch Project, 2022.</b></p> <p><i>Team: Ola Mohamed (15 yrs.), Doaa Saifeldin (14 yrs.), Sara Mutasim (12 yrs.), Siba Tageldin (13 yrs.) and Muzan Alfadel (12 yrs.)</i></p> <p><i>Supervisor: Yousif Alamin, Sudan University of Science and Technology.</i></p> <p><b>2. University students and fresh graduate group Project, 2019.</b></p> <p><i>Team: Rawah Hassan, Rihab Alsayed, and Marwa Salah</i></p> <p><i>Supervisor: Hashim Faisal, University of Khartoum.</i></p>	<p><b>PAPER SESSION: Energy and Materials</b></p> <p><i>Chair: Jephias Gwamuri</i></p> <p><b>219: SOLAR POWER FUTURES: BOTTOM-UP POWER</b> <i>Lyam Rivera, Javier Moscoso-Cabrera, Alexis Burgos-Rivera, Reiner Simshauser-Arroyo, and Marcel Castro-Sitiriche</i></p> <p><b>216: MICROALGAL BIOMASS AS BIOFACTORIES FOR THE PRODUCTION OF BIOENERGY AND BIOFUNCTIONAL COMPOUNDS FOR PHARMACEUTICAL APPLICATIONS</b> <i>Taurai Mutanda, Nicole Pillay and Akash Anandraj</i></p> <p><b>79: RENEWABLE ENERGY ALGORITHM TOOL FOR RURAL ELECTRIFICATION AND APPROPRIATE</b> <i>Robert A. García Cooper and Marcel Castro Sitiriche</i></p>	<p><b>WORKSHOP: Education, Knowledge, and Technology Transfer (II)</b></p> <p><b>7: HOW TO INCORPORATE A CITIZEN SCIENCE APPROACH INTO AT PROJECTS?</b></p> <p><i>Organizers:</i> <i>Gada Kadoda, Marwan Adam, Rofaida El Zubair, Safa Mohamed, Rawan Sharfi, Wadah Omer, Fatima Salah, Sahl Wasin, and Dalia Eissa</i></p>	<p><b>WORKSHOP: Governance   Policy, Standards, and Ethics (II)</b></p> <p><b>2: SCIENCE, TECHNOLOGY AND INNOVATION APPLICATION TO BUILD GRAND HYDROELECTRIC GENERATION DAMS IN AND FOR AFRICA: THE CASE OF GERD</b></p> <p><i>Organizer:</i> <i>Mammo Muchie</i> Professor, Tshwane University of Technology, South Africa</p> <p><i>Panelists:</i> <i>Asim El Magraby</i> Professor, Environmental Science, Ecosystem Management and Conservation, University of Khartoum</p> <p><i>Muna Musnad</i> Assistant Professor, UNESCO Chair in Water Resources, Omdurman Islamic University</p> <p><i>Adil Elkhidir</i> Associate Professor, Water Research Center, University of Khartoum</p>

TIME (Central Africa Time)	<a href="#">ROOM A</a>	<a href="#">ROOM B</a>	<a href="#">ROOM C</a>	<a href="#">ROOM D</a>
4 - 5	<p><b>Featured Women Innovators:</b></p> <p><i>Maab Arbab Mohammed Elfadul</i> Engineer, Cooperation International (COOPI) Organization, Sudan</p> <p><i>Safia Elfadni</i> Medical Doctor and Entrepreneur, Alsalam Factory, Sudan</p> <p><b>PART II: PANEL (2 hours)</b></p> <p><b>Panelists:</b></p> <p><i>Hattie Carwell</i> Vice President, International Network on Appropriate Technology, USA</p> <p><i>Iman Abuelmaaly Adelrahman</i> Professor, University of Khartoum</p> <p><i>Amira Osman</i> Professor, Tshwane University of Technology, South Africa</p> <p><b>Commentator:</b></p> <p><i>Weam Shawgi</i> Feminist and Gender Defender, Sudan</p>	<p><b>184: REAL ENVIRONMENTAL PROBLEMS REQUIRING REAL SOLUTIONS: THE DEVELOPMENT AND APPLICATION OF INNOVATIVE BIOMATERIALS IN NEW PRODUCT DEVELOPMENT WITHIN INDUSTRIAL DESIGN EDUCATION</b> <i>Martin Bolton</i></p> <p><b>175: ANALYSIS OF ROOFTOP GRID CONNECTED SOLAR PV VS UTILITY SCALE PV POWER PLANT, SUDAN CASE STUDY</b> <i>Mahmoud Hassan Onsa, and Iman Onsa</i></p> <p><b>144: INNOVATIVE METHODS TO IMPROVE AERODYNAMIC PERFORMANCE OF SAVONIUS TYPE WIND TURBINE</b> <i>Mai K. H. Mohamed, Hadia I. E. Elhassan, and Eltayeb M. Eljack</i></p> <p><b>153: CONTROL OF DYNAMIC STALL ON A PITCHING AIRFOIL USING A LEADING-EDGE ROTATING CYLINDER</b> <i>Munib Zain, Elasm Elhaj, and Eltayeb Eljack</i></p>		

TIME (Central Africa Time)	<a href="#">ROOM A</a>	<a href="#">ROOM B</a>	<a href="#">ROOM C</a>	<a href="#">ROOM D</a>
		<p><b>141: AIRFOIL GUST LOAD ALLEVIATION USING A ROTATING LEADING-EDGE CYLINDER</b>  <i>Ahmed M. A. AbdAllah, Moayed S. M. Hassan, Eltayeb M. Eljack.</i></p>		
5 – 6		<p><b>PAPER SESSION: Technology R&amp;D   Services Industry</b>   <i>Chair: Jephias Gwamuri</i></p> <p><b>132: THE DEVELOPMENT OF AN APPROPRIATE ASSISTIVE DEVICE FOR WATER SAFETY TRAINING IN SOUTH AFRICAN SCHOOLS</b>  <i>Wessel Wessels and Ashton Margarete Moseley</i></p> <p><b>46: WASTE WATER TREATMENT VIA ACTIVATED FLY ASH ADSORBENT</b>  <i>Afaf Ghais Abadi</i></p>		
6 – 8 PM	<b>CONFERENCE DINNER</b>			



**DAY 4: Friday 25 November [Venue: Ministry of Higher Education and Scientific Research, Khartoum]**

TIME (Central Africa Time)	<a href="#">ROOM A</a>	<a href="#">ROOM B</a>	<a href="#">ROOM C</a>	<a href="#">ROOM D</a>
8 – 9 AM				
9 - 10 *Tea/Coffee	<p><b>KEYNOTE TALK (VII)</b></p> <p><b>APPROPRIATE TECHNOLOGY, AND SUSTAINABLE PEACE AND DEVELOPMENT: A REFLECTION ON SUDAN</b></p> <p><i>Speaker: Guma Kunda</i></p> <p><i>Moderator: Gada Kadoda</i></p>			
10 - 11	<p><b>PANEL: KNOWLEDGE PRODUCTION AND INNOVATION IN AFRICA</b></p> <p><i>Chair: Mohamed El Amin El Tom</i> Professor; Former Minister of General Education (2019 – 2021)</p> <p><b>Panelists:</b></p> <p><i>John Trimble</i> Professor, Tshwane University of Technology, South Africa; President of the International Network on Appropriate Technology</p> <p><i>Khalid Ali</i> Engineer and Business Consultant; co-founder of Impact Hub Khartoum, Sudan</p>			
11 - 12 PM				

**10<sup>th</sup> ICAT PROGRAM | 22 – 25 NOVEMBER 2022** [Click on ROOM to go to ZOOM ROOM]

TIME (Central Africa Time)	<a href="#">ROOM A</a>	<a href="#">ROOM B</a>	<a href="#">ROOM C</a>	<a href="#">ROOM D</a>
	<p><i>Gussai H. Sheikheldin</i> PhD; Research Fellow with STIPRO (Science, Technology and Innovation Policy Research Organization), Tanzania; and former Director of IRCC (Industrial Research and Consultancy Centre), Sudan (2020 – 2021)</p> <p><i>Khansa Alhag</i> Engineer; Managing Partner of 249 Startups Sudan</p> <p><i>Yahia Holi</i> Executive Office Manager, National Information Centre, Sudan</p> <p><i>Tanzeil Hashim</i> PhD Candidate; Forensic Chemist, Sudan Forensic Laboratory</p>			
12 - 2	<b>LUNCH &amp; PRAYERS BREAK</b>			

TIME (Central Africa Time)	ROOM A	ROOM B	ROOM C	ROOM D
2 - 3	<p><b>SCHOOL STUDENTS' SESSION:</b></p> <p><i>This is an exhibition of SCIENCE PROJECTS and ART WORKS by students from the following organizations and schools:</i></p> <ul style="list-style-type: none"> <li>• STEM SUDAN</li> <li>• JUNIOR INNOVATORS</li> <li>• STEPS INTERNATIONAL SCHOOL</li> </ul>	<p><b>TECHFAIR SESSION:</b></p> <p><b>8: DUNIA AL-MADARIS: A PROJECT BLENDING APPROPRIATE TECHNOLOGY AND CITIZEN SCIENCE</b>  <i>Gada Kadoda, Marwan Adam, Rofaida El Zubair, Safa Mohamed</i></p> <p><b>160: CONTROLLING FLOOD AND BENEFITING IN IRRIGATION PURPOSES AND IN GENERATION ELECTRICITY IN THE RIVER NILE</b>  <i>Enas Bushra Homaida Ahmed, Maab Mohamed Ahmed Omer, and Maaz Omer Mohammedani Hamed</i></p> <p><b>61: ONLINE ELECTION DASHBORAD FOR CANDIDATES VOTING</b>  <i>Safa Mohammed Ahmed Suliman and Iman Adam El Tayeb</i></p>		<p><b>POSTER SESSION:</b></p> <p><b>50: TUTI ISLAND – PROPOSALS OF SUSTAINABLE URBAN DEVELOPMENT</b>  <i>Andrea Dung, Martin Speth, and Clemens Bonnen</i></p> <p><b>107: IMPROVING INCUBATION PROGRAMS MECHANISMS FOR CREATIVE IDEA TO ENHANCE PRODUCTION PROCESS</b>  <i>Yahia Holi</i></p> <p><b>18: GOLD DETECTION USING REMOTE SENSING AND ARTIFICIAL NEURAL NETWORK TECHNIQUES</b>  <i>Ahmed Dawod M. Ibrhum, Moawia Elfaki Yahia Eldow, and Anwar F.A. Dafaalla</i></p> <p><b>94: THE USE OF RECYCLED SLAG STEEL POWDER IN FINGER PRINT PROCEDURE AFTER CHEMICAL TREATMENT</b>  <i>Abdelazem E.A. Mohamed, Sahl Yasin, Abdelsakhi Suliman, Sara Eljaile, Mohammed A. Halato, and Siddig T Kafi</i></p>
3 - 4 *Tea/Coffee				<p><b>148: NUMERICAL INVESTIGATION OF AIRFOIL DIPOLE NOISE DUE TO FLOW SEPARATION AND REATTACHMENT AT NEAR STALL CONDITIONS</b>  <i>Mohamed G. H. Salih, Omer E. K. Mustafa, and Eltayeb M. Eljack</i></p> <p><b>154: NUMERICAL SIMULATION OF FLUID FLOW AND HEAT TRANSFER IN A PLANETARY GEARBOX</b>  <i>Rawy J.M. Ibrahim, Ammar E.M. Elamin, and Eltayeb M. Eljack</i></p> <p><b>155: IMPROVEMENT OF AERODYNAMIC PERFORMANCE OF STRAIGHT-BLADED DARRIEUS WIND TURBINE USING BLADES EQUIPPED WITH MOVING SURFACE</b>  <i>Abdelsalam Sharfy, Albraa S. S. Mohammed, and Eltayeb Eljack</i></p> <p><b>111: THE USE OF ANIMAL SENSOR DATA FOR PREDICTING ANIMALS' ACTIVITIES USING MACHINE LEARNING</b>  <i>Hiba ELJozouly AbDELwahab Mohamed</i></p>

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TIME (Central Africa Time)	ROOM A	ROOM B	ROOM C	ROOM D
			<p><b>60: DESIGN OF A PROSTHETIC KNEE-JOINT BASED ON 4BAR MECHANISM FOR AMPUTEES IN THE DEVELOPING WORLD</b>  <i>Safa Elamin Mahmoud Hamad, Hanna Gasem Ahmed Abdalla, Mona Elemam Ali Sharf Aldeen, Fatima Galal Ahmed Elsayed, Mohamed Ibrahim Salih Fadul, and Altayeb Mobarak Altayeb Babeker</i></p> <p><b>103: USING OF A LOCAL HERB (CYMBOPOGON SCHOENANTHUS) AS APPROPRIATE TECHNOLOGY FOR ENHANCE A HEALTH</b>  <i>Salma Mohammed Alameen</i></p> <p><b>135: UNSATURATED FATTY ACID HINDERED PORPHYROMONAS GINGIVALIS PATHOGENICITY FACTORS</b>  <i>Sara Ahmed Eltigani, Mohamed Mutasim Eltayeb, and Jiro Arima</i></p> <p><b>131: A COMMUNIYY-ORIENTED MOBILE APPLICATION MODEL FRAMEWORK TO CONTROL PRODUCTS PRICE</b>  <i>Mathani Hajali</i></p>	
4 - 5	<p><b>KEYNOTE TALK (VIII)</b></p> <p><b>APPROPRIATE TECHNOLOGY MANIFESTO AND TECHNOLOGY POLICY</b></p> <p><i>Speaker: John Trimble</i></p> <p><i>Moderator: Marcel J. Castro Sitiriche</i></p>			
5 – 6 PM	<p><b>CLOSING SESSION</b></p> <p><i>Chair: Gada Kadoda</i></p>			

**Saturday 26 November: CULTURAL PROGRAM**