

## Welcome Message

### **Dear ICAST-2022 Participants,**

On behalf of the Organizing Committee, we warmly welcome you to the 10<sup>th</sup> EAI International Conference on the Advancements of Science and Technology (ICAST-2022) which will be held on November 4 - 6, 2022 in the beautiful city of Bahir Dar, Ethiopia. This conference is a very special edition not only because it is the reflection of ten years of success, but also because Bahir Dar University is celebrating its Diamond Jubilee. ICAST was first introduced in 2012 as a national conference and it was upgraded to an international conference the following year. Over the years, the conference has grown both in terms of the number of participants and themes. This year, the conference is organized into seven tracks focusing on wide scopes of engineering, technology, and innovations. In addition to increasing the number of participants, ICAST continuously strives to improve the quality of papers through a thorough review process and publication of proceedings in internationally recognized venues. Since 2018, the ICAST conference proceedings are being published as a book series in Springer. In ICAST 2022, we had 217 submissions, 90 of them were accepted, and 61 papers are included in the final program.

Similar to previous ICAST conferences, the goal of ICAST-2022 is to provide a platform for researchers, engineers, as well as industrial professionals from Ethiopia and abroad to present and discuss their innovative research results. The conference will include keynote and plenary speakers, technical paper presentations in seven parallel sessions, posters, and technology exhibitions to allow attendants to present their scientific results in different thematic areas. Since it is the 10<sup>th</sup> ICAST, we have added a pre-conference workshop collaborating with the Ethiopian Academy of Sciences (EAS) and a post-conference symposium co-hosted by the Poly Alumni Network (PAN). We hope that many young engineers and scientists will take this opportunity to extend their network and have scientific discussions with some of the leading scientists in science and technology.

Organizing a conference of this size is not an easy task. To that end, we would like to thank the organizing committee for their dedication, European Innovation Alliance (EIA) group for providing their conference organizing knowledge and guidance, and BiT management for their all-round support. The contribution of researchers, academicians, and experts in the area of engineering, science, and technology were crucial in the review process. Lastly, we would like to thank all of the conference participants and authors for their scientific contributions.

The City of Bahir Dar, one of the leading tourist destinations in Ethiopia, with a variety of attractions in the nearby Lake Tana and Blue Nile River, will make your participation in ICAST-2022 a memorable event. Welcome to Bahir Dar and we hope you will enjoy your stay!

**Muluken Zegeye Getie (PhD)**

**Conference General Co-Chair**

**BiT, Bahir Dar University**

**Bereket Haile Woldegiorgis (PhD)**

**Technical Program Chair**

**BiT, Bahir Dar University**

## Keynote Speakers



**Prof. Sossina M. Haile**

Materials Science and Engineering, Northwestern University, Evanston, IL, USA

### **“Electrochemistry for Sustainable Energy Technologies”**

Sossina M. Haile is the Walter P. Murphy Professor of Materials Science and Engineering at Northwestern University, a position she assumed in 2015 after serving 18 years on the faculty at the California Institute of Technology. She earned her Ph.D. in Materials Science and Engineering from the Massachusetts Institute of Technology in 1992 and spent two years, 1991-1993, at the Max Planck Institute for Solid State Research in Stuttgart, Germany, first as a Fulbright Fellow then as a Humboldt Fellow. Prof. Sossina’s research broadly encompasses materials, especially oxides, for sustainable electrochemical energy technologies. Her work in fuel cell science and technology has pushed the field to new insights and record performance metrics. In parallel, she has created new avenues for harnessing sunlight to meet rising energy demands. Amongst her many awards, in 2008 Prof. Sossina received an American Competitiveness and Innovation Fellowship from the U.S. National Science Foundation in recognition of “her timely and transformative research in the energy field and her dedication to inclusive mentoring, education and outreach across many levels.” In 2010 she was the recipient of the Chemical Pioneer Award (American Institute of Chemists), in 2012 the International Ceramics Prize (World Academy of Ceramics), and in 2020 the Turnbull Lectureship (Materials Research Society). She is a fellow of the Materials Research Society, the American Ceramics Society, the African Academy of Sciences, and the Ethiopian Academy of Sciences, and serves on the editorial boards of *Annual Review of Materials Research*, *MRS Energy and Sustainability*, and *Joule*. Her professional service includes past membership on the board of the Materials Research Society and current membership on the board of Ethiopia Education Initiatives.



**Asregedew Kassa Woldesenbet, PhD, PE**

Associate Professor & Chair Holder of Construction Management at Ethiopian Institute of Architecture Building Construction and City Development, Addis Ababa University and Adjunct Faculty at Bahir Dar Institute of Technology, Bahir Dar University

**“Construction Industry Practice: Current Efforts, Challenges & Way-Forward”**

Asregedew is an Associate Professor & Chair Holder of Construction Management at Ethiopian Institute of Architecture Building Construction and City Development (EiABC), Addis Ababa University (AAU) and Adjunct Faculty at Bahir Dar Institute of Technology (BIT), Bahir Dar University (BDU). Prior to joining AAU & BDU, Asregedew was an Assistant Professor at University of Nebraska-Lincoln (UNL) in the USA. Asregedew received his PhD degree from Iowa State University in 2014, MSc from Oklahoma State University in 2010 & BSc from Bahir Dar University in 2005. His research areas and interests include Asset Management, Construction Project Engineering & Management, Data-driven Decision Making Processes & Models, Construction Data analytics, and Engineering & Construction Management Education. Asregedew has published more than 30 articles on peer-reviewed & reputable journals and as conference proceedings. Asregedew has served as journal reviewer, associate editor, proposal reviewer & panel expert for various agencies & associations such as Transportation Research Board (TRB): National Corporate Research Highway Program (NCHRP), National Science Foundation (NSF), and Ethiopian Association of Civil Engineers (EACE).

**10<sup>th</sup> EAI International Conference on Advancements of Science and Technology- ICAST  
2022: November 4-6, 2022 Bahir Dar, Ethiopia**

**Track 1:**

**Mulugeta Admasu Delele, Ph.D**

Associate Professor, Faculty of Chemical and Food Engineering, Bahir Dar Institute of Technology, Bahir Dar University, P.O. Box 26, Bahir Dar, Ethiopia

Title: **Physics based digital twins in postharvest and food processing systems**

**Aberham Hailu Feyissa, Ph.D**

Associate Professor, Research group for Food Production Engineering, Technical University of Denmark (DTU), Denmark

Title: **Alternative processes for sustainable food processing**

**Track 2:**

**Seid Muhie Yimam, Ph.D**

Technical Lead at House of Computing and Data Science and Research Associate at LT Group, Universität Hamburg, Germany

Title: **AI and Data Science Approaches Adoption for the Innovation of Emerging Economies**

**Track 3:**

**Fekahmed Negash Nuru**

Freelance Consultant on Water Resources Management

Title: **The Role Good Water Governance at National level in enhancing Transboundary Cooperation**

**Track 4:**

**Sisay Geremew Gebeyehu, Ph.D**

Associate Professor, Faculty of Mechanical and Industrial Engineering, Bahir Dar Institute of Technology, Bahir Dar University, P.O. Box 26, Bahir Dar, Ethiopia

Title: **Bridging the Transition from Innovative Startups to Established Companies: A Commercialization Strategy for Ethiopian Innovation Ecosystem**

**Track 5:**

**Fekadu Shewarega, Ph.D**

Academic programs officer of the Institute of Electric Energy Systems, University Duisburg-Essen

Title: **The transition from conventional to predominantly renewable based power generation and the resulting challenges for safeguarding supply security in electrical power systems**

**Fikreselam Gared, Ph.D**

Associate Professor, Faculty of Electrical and Computer Engineering, Bahir Dar Institute of Technology, Bahir Dar University, P.O. Box 26, Bahir Dar, Ethiopia

Title: **Technologies and Challenges for Wireless Networks of 2030 and Beyond**

**Track 6:**

**Teketel Yohannes Anshebo, Prof**

Professor in Chemistry Department, College of Natural and Computational Sciences Addis Ababa University

Title:

**Elias Wagari Gabisa, Ph.D**

Assistant professor of energy and environment at Bahir Dar Institute of Technology, Bahir Dar University, and a researcher at King Mongkut's University of Technology Thonburi (KMUTT), Thailand

Title:

**Track 7:**

**Desalegn Alemu Mengistie, Ph.D.**

Senior Scientist, E Ink Corporation, Fremont, California, USA

Title: **Conductive polymers: from conductivity enhancement to energy related applications**

**10<sup>th</sup> EAI International Conference on Advancements of Science and Technology- ICAST  
2022: November 4-6, 2022 Bahir Dar, Ethiopia**

**Organizing Committee ICAST-2022**

**Conference General Chair**



**Professor Kibret Mequanint**

University of Western Ontario, Canada

**General Co-Chair**



**Dr. Mekuanint  
Agegnehu Bitew**

**Technical Program  
Chair**



**Dr. Bereket Haile  
Woldegiorgis**

**General Co-Chair**



**Dr. Muluken  
Zegeye Getie**

Track Chairs



Dr. Abdulkerim  
Mohammed Yibre



Dr. Addisu  
Alemayehu Assegie



Dr. Assefa Asmare  
Tsegaw



Dr. Eshetu Getahun  
Mulat



Dr. Birhanu  
Kebede



Dr. Ephrem  
Yetbarek Gedilu



Dr. Teketay Mulu  
Beza



Dr. Zenamarkos  
Bantie Sendekie

**10<sup>th</sup> EAI International Conference on Advancements of Science and Technology- ICAST  
2022: November 4-6, 2022 Bahir Dar, Ethiopia**

**General Program Outline**

	08:30-10:10	10:10-10:40	10:40-12:00	12:00-14:00	14:00-17:30	18:00-21:00
Friday, November 4, 2012	Registration Pre-conference Workshop [Ethiopian Academy of Sciences]				Opening [Non-Technical] and Plenary/keynote	
Saturday, November 5, 2022	Parallel Technical Sessions	Coffee Break	Parallel Technical Sessions	Lunch Break	Parallel Technical Sessions	Conference Dinner
Sunday, November 6, 2022	Post-conference Symposium [Poly Alumni Network ]					

**Day One**

**Pre-conference workshop  
Friday, November 4, 2022 (8:30-12:20)  
The Ethiopian Academy of Sciences**

<b>Time</b>	<b>Events</b>	<b>Responsible Person/Moderator</b>
8:30 – 9:00 AM	Registration of participants and Opening	EAS – BDU
9:00 – 9:30 AM	The Ethiopian Academy of Sciences: A Journey So far	Prof. Teketel Yohannes, EAS Fellow: Natural Sciences Working Group, Executive Director, Ethiopian Academy of Sciences (EAS)
9:30 – 10:00 AM	Science and Engineering Education Policy Analysis	Prof. Afework Kassu, EAS Fellow: Health Working Group, EAS Board Member and Director, Armauer Hansen Research Institute (AHRI)
10:00 – 10:30 AM	Discussion/Q and A	Prof. Kibret Mequanent, EAS Associate Fellow
10:30 – 10: 50 AM	Tea break	
10:50 – 11: 20 AM	Agro-processing	Dr. Firew Tegegne, EAS Fellow: Agricultural Working Group, President, Bahir Dar University
11:20 AM – 11:50 AM	Technology Innovation and Commercialization	Dr. Mengesha Mamo, EAS Fellow: Engineering and Technology Working Group, Chairperson: Engineering and Technology Working Group
11:50 – 12:20 PM	Discussion / Q and A	Prof. Kibret Mequanent, EAS Associate Fellow

**10<sup>th</sup> EAI International Conference on Advancements of Science and Technology- ICAST  
2022: November 4-6, 2022 Bahir Dar, Ethiopia**

**Opening Technical and Non-Technical Program  
Friday November 4, 2022 (14:00-17:30)**

Time	Opening Technical and non-technical Program (Room: Washera Hall, BiT)		
	Event	Presenter	Moderator
13:30-14:00	Registration	<b>Participant</b>	ICAST committee
14:05-14:10	Program Introduction	<b>Prof. Kibret Mequanint</b>	<b>Prof. Kibret Mequanint</b>
14:10-14:15	Message from the Conference Technical Program Chair	<b>Dr. Bereket Haile</b>	
14:15-14:20	Message from the Scientific Director of BiT	<b>Dr. Bimrew Tamirat</b>	
14:20-14:30	Welcome Speech by the President of Bahir Dar University	<b>Dr. Firew Tegegne</b>	
14:30-14:40	Opening Speech by the Guest of Honor	<b>H.E Mr. Solomon Soka</b> Director General, Information Network Security Administration (INSA)	
14:40-15:30	<i>Keynote Speaker 1</i> Electrochemistry for Sustainable Energy Technologies	<b>Prof. Sossina M. Haile</b>	
15:30 – 16:20	<i>Keynote Speaker 2</i> Construction Industry Practice: Current Efforts, Challenges & Way- Forward	<b>Dr. Asregedew Kassa</b> <b>Woldesenbet</b>	
16:20 – 16:40	<i>Discussion and Q &amp; A</i>	<b>Participant</b>	
16:40 – 17:30	<b>Cocktail and Exhibition</b>		



**10<sup>th</sup> EAI International Conference on Advancements of Science and Technology- ICAST  
2022: November 4-6, 2022 Bahir Dar, Ethiopia**

**Day 2  
Parallel Sessions – Sessions 1 - 7  
Saturday November 5, 2022 (Time: 8:30 -17:30)**

<b>Time</b>	<b>Session 1: Sustainable Processes for Green Technologies (Room # 001) Session Chair: Dr Metadel Kassahun Rapporteur: Dr. Temesgen Atnafu</b>
8:30-9:00	<b>Keynote Speaker # 1 Mulugeta Admasu Delele</b>  Physics based digital twins in postharvest and food processing systems
9:10-9:30	Characterization of False Banana Fiber as a Potential Re-reinforcement Material for Geopolymer Composites <i>Lulseged Belay Addis, Zenamarkos Bantie Sendekie, Nigus Gabbiye Habtu, Dirk W. Schubert, Judith A. Roether, Aldo R. Boccaccini</i>
9:30- 9:50	Drying Characteristics and Kinetic Study of Coffee Cherries (Coffee Arabica) in Convective Hot Air Dryer <i>Zelalem M. Salehudress, Nigus G. Habitu, Bimerew T. Adimasu, Mulugeta A. Delele, Aynadis M. Asemu</i>
9:50-10:10	Effect of threshing moisture content, threshing methods, and storage bags on mold contamination of stored maize Grain ( <i>Zea mays</i> L.) <i>Messenbet Geremew Kassa, Aynadis Molla Asemu, Admassu Fanta Worku, Biresaw Demelash Abera1, Nigus Gabye Habtu</i>
10:10 – 10:40	<b>Coffee Break</b>
	<b>Session Chair: Dr. Aynadis Molla Rapporteur: Dr. Fentanesh Nibret</b>
10:40-11:00	Effects of initial moisture content and storage duration on physical and chemical characteristics of stored maize ( <i>Zea mays</i> L.) grain <i>Habtamu Gebremichael, Mulugeta Admasu, Solomon Workneh, Nigus Gabbiye, Metadel Kassahun, Admasu Fanta</i>
11:00-11:20	Identification of Dominant Lactic Acid Bacteria and Yeast Species from Teff Injera Dough Fermentation <i>Zinash Tadesse Bongor, Metadel Kassahun Abera, Takele Ayanaw, Agimassie Agazie, Mesfin Wogayehu, Deginet Teferi, Abebaw Teshome, Taddele Andarge</i>
11:20-11:40	Investigation and optimization of the energy band gap of PAM/PVP/Al <sub>2</sub> O <sub>3</sub> composites <i>Negese Yazie Amogne, Delele Worku Ayele, and Nigus Gabbiye Habtu, Addisu Alemayehu</i>
12:00 – 13:30	<b>Lunch Break</b>
	<b>Session Chair: Dr. Solomon Workneh Rapporteur: Dr. Admasu Fanta</b>
13:30 – 14:00	<b>Keynote Speaker # 2 Aberham Hailu Feyissa</b>  Alternative processes for sustainable food processing
14:00- 14:20	Performance Evaluation of GrainPro Collapsible Natural Convection Solar dryer for Maize Grain in Ethiopia <i>Messenbet Geremew Kassa, Aynadis Molla Asemu</i>
14:20-14:40	Production and Characterization of Ink from the Milky Fluid of Ficus Vasta and Euphorbia Abyssinica <i>Surafel Argahegn, Mequanint Demeke, Yemsrach Mintesnot, Belete Adane</i>

**10<sup>th</sup> EAI International Conference on Advancements of Science and Technology- ICAST  
2022: November 4-6, 2022 Bahir Dar, Ethiopia**

14:40-15:00	Yeast Bioremediation of Cr(VI) from tannery wastewater <i>Tessafa Abrham Ashagrie, Shegaw Ahmed, Asmare Tezera, Mekuanint Demeke</i>
<b>15:00-17:30</b>	<b>Networking/Refreshment Break &amp; Poster Session</b>
<b>18:00-20:00</b>	<b>Dinner (Jacaranda)</b>

**Day 2**  
**Parallel Sessions – Sessions 1 - 7**  
Saturday November 5, 2022 (Time: 8:30 -17:30)

Time	Session 2: Artificial Intelligence and Digitalization for Sustainable Development (Room # 002) Session Chair: Dr. Tesfa Tegegne Rapporteur: Abinew Ali
8:30-9:00	<b>Keynote Speaker # 1 Seid Muhie Yimam</b> AI and Data Science Approaches Adoption for the Innovation of Emerging Economies
9:10-9:30	Amharic Text Complexity Classification using Supervised Machine Learning <i>Gebregziabihier Nigusie and Tesfa Tegegne</i>
9:30- 9:50	Amharic Sentence-level Word Sense Disambiguation Using Transfer Learning <i>Neima Mossa and Million Meshesha</i>
9:50-10:10	Artificial intelligence-based Breast and Cervical Cancer Diagnosis and Management System <i>Elbetel Taye Zewde ,Mizanu Zelalem Degu and Gizeaddis Lamesgin Simegn</i>
10:10 – 10:40	<b>Coffee Break</b>
	<b>Session Chair: Dr. Mekonnen Wagaw</b> <b>Rapporteur: Sefi Gebeyehu</b>
10:40-11:00	Transfer Learning with Pre-trained CNNs for Breast Cancer Stage Identification <i>Tesfahunegn Minwuyelet Mengistu, Birtukan Shegaw Arega and Birhanu Hailu Belay</i>
11:00-11:20	Development of an interpretable deep learning system for the identification of patients with Alzheimer’s disease <i>Selamawet Workalemahu Atnafu, and Stefano Diciotti</i>
11:20-12:40	Digital Clinical Decision Support System for Screening of Eye Diseases <i>Gizeaddis Lamesgin Simegn, and Mizanu Zelalem Degu</i>
11:40-12:00	Amharic Character Recognition Using Deep Convolutional Neural Network <i>Achamie Aynalem</i>
12:00 – 13:30	<b>Lunch Break</b>
	<b>Session 3: River Basin Management and Trans-boundary Cooperation (Room # 002)</b> <b>Session Chair: Dr. Temesgen Enku</b> <b>Rapporteur: Dr. Chalachew Abebe</b>
13:30 – 14:00	<b>Keynote Speaker # 1 Fekahmed Negash Nuru</b>

**10<sup>th</sup> EAI International Conference on Advancements of Science and Technology- ICAST  
2022: November 4-6, 2022 Bahir Dar, Ethiopia**

	The Role Good Water Governance at National level in enhancing Transboundary Cooperation
14:00- 14:20	Investigation on Utilizing of Steel Slag as a Partial Replacement of Natural River Sand as a Fine Aggregate in Concrete Production <i>Degsera Fantahun, Shumet Getahun, Solomon Asrat Endale, Mitiku Damtie Yehualaw, Betelhem Tilahun Habtegebreal, and Duy-Hai Vo</i>
14:20-14:40	Engineering Properties of Concrete with Partial Replacement Cement and Course aggregate by Waste Glass Powder and Steel Slag Aggregate <i>Yohannes Berhane Abreha, Begashaw Worku Yifru, and Mitiku Damtie Yehualaw</i>
14:40-15:00	Effect of Partial Replacement of Cement by Metakaolin on Engineering Properties of Concrete <i>Meseret Asrade Fentie, Begashaw Worku Yifru, and Mitiku Damtie Yehualaw</i>
15:00-15:20	Quality Assurance Management Practices in Public Building Construction Projects (The Case of Bahir Dar City) <i>Abrham Zegeye Getie, Bahiru Bewket Mitikie, and Solomon Melaku Belay</i>
	<b>Session Chair: Dr. Fasikaw Atanaw Rapporteur: Dr. Hanibal Lemma</b>
15:20-15:40	Effect of irrigation and fertilizer rate on biomass yield and water use efficiency of forages <i>Misbah A. Hussein, Melkamu Bezabih, Tewodros T. Assefa, Abeyou W. Wale, Amare Hailelassie, Fikadu Tessema, Aberra Adie, and Seifu A. Tilahun</i>
15:40-16:00	Assessment of the causes of Non-Revenue Water in Urban Water Distribution Systems: The case of Bahir Dar City, Ethiopia <i>Yibeltal Fentahun Aycheh, Dagnachew Aklog Yihun, Chalachew Mulat Alemu, and Fasikaw Atanaw Zimale</i>
16:00-16:20	Experimental Investigation on Properties of Mortar Containing Waste Marble as Fine Aggregate <i>Akelilu Musback Eshetie and Mitiku Damtie Yehaulaw</i>
16:20-16:40	Predicting optical water quality indicators from Remote sensing using machine learning algorithms-in tropical highlands of Ethiopia <i>Elias S. Leggesse, Fasikaw A. Zimale, Dagnenet Sultan, T Enku and Seifu A. Tilahun</i>
<b>16:40-17:30</b>	<b>Networking/Refreshment Break &amp; Poster Session</b>
<b>18:00-20:00</b>	<b>Dinner (Jacaranda)</b>

**10<sup>th</sup> EAI International Conference on Advancements of Science and Technology- ICAST  
2022: November 4-6, 2022 Bahir Dar, Ethiopia**

**Day 2**

**Parallel Sessions – Sessions 1 - 7**

Saturday November 5, 2022 (Time: 8:30 -17:30)

<b>Time</b>	<b>Session 4: Agro-Mechanization and Manufacturing Systems (Room # 003)</b> <b>Session Chair: Dr. Addisu Negash</b> <b>Rapporteur: Dr. Teshome Mulatie</b>
8:30-9:00	<b>Keynote Speaker # 1 Sisay Geremew Gebeyehu</b>  Bridging the Transition from Innovative Startups to Established Companies: A Commercialization Strategy for Ethiopian Innovation Ecosystem
9:10-9:30	Participatory Evaluation and Demonstration of Hand Maize Sheller <i>Geta Kidanemariam, Worku Biweta, Seyfe Yilma, and Tekelgiorgis Mamuye</i>
9:30- 9:50	Characteristics of supply chain integration of manufacturing firms in Ethiopia <i>Tenaw Tegbar, Thoben Klaus, D.K. Nageswara Rao, and Bereket Haile</i>
9:50-10:10	Effect of Filtering Techniques in Manufacturing of Optimal Topologies using Additive Manufacturing Process <i>Hailu Shimels Gebremedhen, Dereje Engida Woldemichael, Fakhruddin M Hashim, and Khurram Altaf</i>
10:10 – 10:40	<b>Coffee Break</b>
	<b>Session Chair: Dr. Geta Kidanemariam</b> <b>Rapporteur: Dr. Muluken Temesgen</b>
10:40-11:00	Numerical Simulation and Optimization of a locally built Midibus Structure in Quasi-static and Rollover Condition <i>Hailemichael Solomon Addisu, Ermias Gebrekidan Koricho, and Adino Amare Kassie</i>
11:00-11:20	Process Parameter Optimization of Single Lap-Adhesive Joint Date Palm Fiber Reinforced Polyester Composite Using ANN-Genetic Algorism <i>Ermias Wubete Fenta, and Assefa Asmare Tsegaw</i>
11:20-12:40	Process Parameter Optimization of Single Lap-Bolt Joint Date Palm Fiber Reinforced Polyester Composite Using ANN-Genetic Algorism <i>Ermias Wubete Fenta and Assefa Asmare Tsegaw</i>
11:40-12:00	Design and Numerical Analysis of Sorghum Reaper Machine <i>Adino Amare Kassie, Hailu Shimels Gebremedhen, and Hailemichael Solomon Addisu</i>
12:00 – 13:30	<b>Lunch Break</b>
	<b>Session Chair: Dr. Betsha Tizazu</b> <b>Rapporteur: Dr. Getinet Ayele</b>
14:00- 14:20	Applications of Artificial Intelligence for Fault Diagnosis of Rotating Machines: A Review <i>Fasikaw Kibrete, and Dereje Engida Woldemichael</i>
14:20-14:40	Assistive Smart Cane Technology for Visually Impaired Peoples: A Review <i>Yosef Kassa Shiferaw, and Getnet Ayele Kebede</i>
14:40-15:00	Review on Water Automatic Teller Machines (Water ATM) Technologies <i>Talaksew Misganaw Agegnehu, and Getnet Ayele Kebede</i>
<b>15:00-17:30</b>	<b>Networking/Refreshment Break &amp; Poster Session</b>
<b>18:00-20:00</b>	<b>Dinner (Jacaranda)</b>

**10<sup>th</sup> EAI International Conference on Advancements of Science and Technology- ICAST  
2022: November 4-6, 2022 Bahir Dar, Ethiopia**

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Parallel Sessions – Sessions 1 - 7  
Saturday November 5, 2022 (Time: 8:30 -17:30)**

<b>Time</b>	<b>Session 5: Advances in Electrical and Computer Engineering (Room # 004) Session Chair: Dr. Belachew Bantyriga Rapporteur: Dr. Mezgibu Getinet</b>
8:30-9:00	<i>Keynote Speaker # 1 Fekadu Shewarega</i>  The transition from conventional to predominantly renewable based power generation and the resulting challenges for safeguarding supply security in electrical power systems
9:10-9:30	Application of FACTS Devices for Transient Stability Enhancement in the Adama II Grid-Connected Wind Farm <i>Yosef Birhan Jember, Tewodros Gera Workineh, Tefera T.Yetayew, and Mersa Dinkayow</i>
9:30- 9:50	Experimental analysis of the effect of exposure of an Electro-Optic system to external Magnetic field (Case study: The input Laser and the output Detector are separately and concurrently exposed) <i>Alema Abraha and Getachew Alemu</i>
9:50-10:10	A Headphone Based Heart Rate (Hr) and Heart Rate Variability (Hrv) Monitoring Unit <i>Gashaye Lewtie Hailu,</i>
10:10 – 10:40	<b>Coffee Break</b>
	<b>Session Chair: Dr. Prof. Pushparaghavan Annamalai Rapporteur: Tadie Birhan</b>
10:40-11:00	Deep Complex-valued Neural Networks for MIMO Signal Detection <i>Isayiyas Nigatu Tiba and Mao youhong</i>
11:00-11:20	A Finite Time Trajectory Tracking of Mobile Robot Using Cascaded Terminal Sliding Mode Control Under Presence of Random Gaussian Disturbance <i>Adisu Safo Boseru, Ayodeji Olalekan salau, Asrat Gedefa Yadessa and Kaheli Anteneh Jembere</i>
11:20-12:40	Fuzzy Sliding Mode Controller Based Trajectory Tracking Control of Free Flying Space Robot Manipulator System <i>Esubalew W.Shibabw and Gerbaw Y.Tamiru</i>
11:40-12:00	Design and performance analysis of a multi-level fuzzybased stabilizer to dampen low frequency oscillation in single-machine infinite bus systems <i>Tenaw Ayew Mezigebe and Belachew Bantyriga Gessesse</i>
12:00 – 13:30	<b>Lunch Break</b>
	<b>Session Chair: Dr. Tassew Tadiwose Rapporteur: Molla Atanaw</b>
13:30 – 14:00	<i>Keynote Speaker # 2 Fikreselam Gared</i>  Technologies and Challenges for Wireless Networks of 2030 and Beyond
14:00- 14:20	Impact of Parametric Uncertainties on the Steady State Performances of Wind Energy Conversion System <i>Endalew Ayenew, Getachew Biru, Asrat Mulatu, and Milkias Berhanu</i>

**10<sup>th</sup> EAI International Conference on Advancements of Science and Technology- ICAST  
2022: November 4-6, 2022 Bahir Dar, Ethiopia**

14:20-14:40	Super Twisting Sliding Mode Controller for Trajectory Tracking Control of Autonomous Ground Vehicle System <i>Tamiru Takele, Tefera T. Yetayew and Sam Sum Ma</i>
14:40-15:00	Optimal Placement and Size of Multiple PV-DG Units for Power Loss Reduction and Voltage Profile Improvement in Dilla Distribution Network <i>Assen Beshr and Tefera T. Yetayew</i>
15:00-15:20	Trajectory Tracking of a Two-Wheeled Mobile Robot Using Backstepping and Nonlinear PID Controller <i>Lencho Duguma Fufa and Endalew Ayenew</i>
15:20-15:40	Prediction of Teff Yield using Machine Learning <i>Eneyachew Tamir and Adugna Necho</i>
<b>15:40-17:30</b>	<b>Networking/Refreshment Break &amp; Poster Session</b>
<b>18:00-20:00</b>	<b>Dinner (Jacaranda)</b>

**Day 2**  
**Parallel Sessions – Sessions 1 - 7**  
Saturday November 5, 2022 (Time: 8:30 -17:30)

<b>Time</b>	<b>Session 6: Advances in Green Energy Technologies (Room # 005)</b> <b>Session Chair: Dr. Nigus Gabbiye</b> <b>Rapporteur: Netsanet Ejigu</b>
8:30-9:00	<b>Keynote Speaker # 1 Teketel Yohannes Anshebo</b>
9:10-9:30	Technological development and adoption rates of injera baking stoves – A review <i>Lamesgin Addisu Getnet and Muluken Zegeye Getie</i>
9:30- 9:50	Design, manufacturing and experimental investigation of solar cooker using parabolic dish collector for indoor cooking application <i>Mulat Shitye Alem, Bimrew Tamrat Admasu, Temesgen Assefa Minale, muluken Zegeye Getie, and Hailemariam Mulugeta Wassie</i>
9:50-10:10	Techno-Economic Analysis of Biogas Production from Cladodes of Cactus ( <i>Opuntia ficus-indica</i> ) <i>Jemal Beshir Belay</i>
<b>10:10 – 10:40</b>	<b>Coffee Break</b>
	<b>Session Chair: Dr. Ababay Ketema</b> <b>Rapporteur: Biniyam Zemene</b>
10:40-11:00	Zn(NO <sub>3</sub> ) <sub>2</sub> .6H <sub>2</sub> O/Urea Composite Deep Eutectic Solvents derived Through Facile and Green Synthesis Approach As an Electrolyte for Rechargeable Zinc Air Batteries <i>Fentahun Adamu Getie, Delele Ayele Worku, Nigus Gabbiye Gabbiye Habtu, Temesgen Atinafu Yemata, and Fantahun Aklog Yihun</i>
11:00-11:20	Prediction of Global Solar Radiation Based on Sunshine Hours in Ethiopia's Amhara Region <i>Teshome B. Kotu, Venkata R. Ancha, Abdulkadir A. Hassen, and Solomon W. Fanta</i>
11:20-12:40	Experimental Investigation on Thermal Performance of Parabolic Solar Dish Concentrator based Solar Dryer Assisted with Thermal Energy Storage system <i>Hailemariam Mulugeta Wassie, Bimrew Tamrat Admasu, Muluken Zegeye Getie, and Mulat Shitye Alem</i>

**10<sup>th</sup> EAI International Conference on Advancements of Science and Technology- ICAST  
2022: November 4-6, 2022 Bahir Dar, Ethiopia**

11:40-12:00	Formulation and Evaluation of Firefly and Artificial Bee Colony Algorithms for Maximum Power Extraction of Photovoltaic Systems under Partial Shade <i>Tefera T. Yetayew and Tigist D. Wudmatas</i>
12:00 – 13:30	<b>Lunch Break</b>
	<b>Session Chair: Dr. Solomon Workneh Rapporteur: Kassa Wudneh</b>
13:30 – 14:00	<b>Keynote Speaker # 2 Elias Wagari Gabisa</b>
14:00- 14:20	Mathematical Modeling and Simulation of Mixed-Mode Natural Convection Solar Dryer with and without Solar Air Heater for Green Banana Flour Production <i>Betelihem Zemedkun Lodamo, Kamil Dino Adem, and Fiseha Kedir Jemal</i>
14:20-14:40	Evaluation of Planetary Ball Milling and Mild-Alkaline Pretreatment for Enhanced Fermentable Sugar Production from Sugarcane Bagasse <i>Yalew Woldeamanuel Sitotaw, Nigus Gabbiye Habtu, and Tom Van Gerven</i>
<b>15:40-17:30</b>	<b>Networking/Refreshment Break &amp; Poster Session</b>
<b>18:00-20:00</b>	<b>Dinner (Jacaranda)</b>

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**Day 2**  
**Parallel Sessions – Sessions 1 - 7**  
**Saturday November 5, 2022 (Time: 8:30 -17:30)**

<b>Time</b>	<b>Session 7: Materials for Emerging Technologies (Room # 006)</b> <b>Session Chair: Dr. Tessera Alemeneh</b> <b>Rapporteur: Dr. Getnet Yenealem</b>
8:30-9:00	<b>Keynote Speaker # 1 Desalegn Alemu Mengistie</b>  Conductive polymers: from conductivity enhancement to energy related applications
9:10-9:30	Evaluation of the impact of wing span and wing chord length on the aerodynamic performance of Cessna 172-R Aircraft <i>Addisu Alamirew Meku, D.K. Nageswara Rao, Mekete Mulualem Mebratu, and Lamesgin Addisu Getnet</i>
9:30- 9:50	Preparation of Thermal Insulation Material from Plastic Scrap, Sawdust and Gypsum <i>Yemsrach Mintesnot, Mequanint Demeke, Surafel Aregahegn, Belete Adane, and Asmare Tezera Admase</i>
9:50-10:10	Mechanical Response Prediction of Fiber Reinforced Composites by using Machine Learning Models: A Review <i>Mekete Mulualem, Addisu Alamirew Meku, and Lamesgin Addisu Getnet</i>
10:10 – 10:40	<b>Coffee Break</b>
	<b>Session Chair: Dr. Misganaw Alemu</b> <b>Rapporteur: Dr. Ephrem Terefe</b>
10:40-11:00	Review on Recent Advancements in Mechanical Properties of Cross Laminated Timber (CLT) <i>Tamirat Semu Yihune and Dawit Wagnebachew Nega</i>
11:00-11:20	Investigating Rutting Performance characteristics of Ethiopian Jute fiber Modified Asphalt Binder <i>Yohannes Sisay Zeleke and Zelalem Alebel Arega</i>
11:20-12:40	Utilization of starch from waste avocado seed for the manufacture of sustainable bio-based adhesive reinforced with clay particles <i>Asmare Tezera Admase, Mequannt Demeke Aynalem, Tessafa Abrham Ashagrie, Yemsrach Mintesnot Melaku and Surafel Aregahegn Agdew</i>
11:40-12:00	Partial Replacement of Cement with Marble and Ceramic Waste Powders in Normal Strength Concrete <i>Abrham Gebre, Rihanna Nuru, and Yisihak Gebre</i>
12:00 – 13:30	<b>Lunch Break</b>
<b>15:40-17:30</b>	<b>Networking/Refreshment Break &amp; Poster Session</b>
<b>18:00-20:00</b>	<b>Dinner (Jacaranda)</b>