

## **Welcome Message**

**Dear ICAST-2024 Participants,**

On behalf of the Organizing Committee, we are honored to welcome you to the 12<sup>th</sup> EAI International Conference on the Advancements of Science and Technology (ICAST-2024), taking place from November 1-3, 2024, in Bahir Dar, Ethiopia. This conference aims to provide a platform for national and international researchers, engineers, and industry professionals to present and discuss their innovative research findings. Since its inception in 2012 as a national conference, ICAST has evolved into an international event, becoming a leading forum for academic and research dialogue in the fields of science, engineering, and technology. Over the years, the quality, number of international participants, and scope of the conference have steadily improved, thanks in part to enhanced communication and a rigorous peer review process. Since 2018, the proceedings of the ICAST conference have been published as a book series by Springer, expanding into three book series across two areas of proceedings since 2022. Additionally, the conference has fostered wider opportunities for young Ethiopian researchers, helping them gain valuable experience in scientific writing and presentation skills.

This year, the conference is organized into seven tracks focusing on wide scopes of engineering, technology, and innovations. In ICAST-2024, we had 175 submissions, 81 of them were accepted, and 59 papers are registered to be presented. The conference will include keynote addresses, plenary speakers, and technical paper presentation sessions. We hope that young engineers and scientists will take this opportunity to extend their network and have scientific discussions with the leading scientists in science and technology.

Organizing a conference of this magnitude is no small feat. However, as Bahir Dar institute of Technology (BiT) continues to prioritize excellence in research, innovation, and education, hosting such conferences has become a yearly tradition. We would like to express our gratitude to the organizing committee for their unwavering dedication, the European Innovation Alliance (EIA) group for their invaluable guidance, the reviewers for their contributions, and the BiT management for their comprehensive support. Finally, we extend our thanks to all conference participants and authors for their scientific contributions. Welcome to Bahir Dar, and we hope you enjoy your stay!

**Muluken Temesgen Tigabu (PhD)**

**Conference General Co-Chair and Technical Program chair**

**BiT, Bahir Dar University**

## Opening Keynote Speakers

### 1. Prof. Desta Mebratu

*Professor at the Centre for Complex Systems in Transition (CST), Stellenbosch University, South Africa*

**Title:** *Systematic shifts for just and sustainable development in Africa*

#### Brief Biography:

Desta Mebratu is a Professor at the Centre for Sustainability Transition, Stellenbosch University, and a Visiting Professor at Addis Ababa Institute of Technology. He is a chemical engineer by background with a specialization in Industrial Environmental Economics. He has more than 35 years of experience in the field of sustainability and sustainable industrial development working for industries, universities, and international organizations. Professor Mebratu has widely published in peer-reviewed journals and co-edited the 'Handbook on Sustainable Development Policy and Administration and the book 'Transformational Infrastructure for Development of a Wellbeing Economy in Africa'. Professor Mebratu is a Fellow of the African Academy of Sciences (FAAS) and several other institutions of Advanced Studies. In 2023, Professor Mebratu was recognized by the Royal Academy of Engineering as one of the Engineering Icons of the Century for his contribution in the field of engineering for sustainability.

### 2. Dr. Dagnachew Aklog

*Faculty of Civil and Water Resources, Bahir Dar Institute of Technology, Bahir Dar University, Ethiopia*

**Title:** *Water-Energy-Food Nexus in Ethiopia: The role of the academia in achieving sustainable development goals*

#### Brief Biography:

Dr. Dagnachew Aklog was born in Ethiopia in 1972 and got his bachelor's degree in Sanitary Engineering from Arba Minch Water Technology Institute (now Arba Minch University) in 1994. He did his masters and doctoral studies in Social Systems Engineering at Tottori University, Japan. His research in MSc and PhD studies focused on modeling and optimization of water distribution systems. After completing his PhD study in 2005, he worked at the Center for International Affairs of Tottori University, Japan until March 2019. He joined Bahir Dar Technology Institute in April 2019 and worked as Director of the Blue Nile Water Institute, Bahir Dar University from October 2019 to July 2023. He is currently an associate professor at the Faculty of Civil and Water Resources Engineering, Bahir Dar Institute of Technology, Bahir Dar University, Ethiopia.

### 3. Prof. Mammo Muchie

*DST-NRF SARChI Chair Rated Research Professor in Innovation Studies, Tshwane University of Technology, South Africa*

**Title:** *Re-Thinking and Re-Designing Science, Technology, Engineering and Mathematics for Sustainable Development for All Humanity in one world Community Future*

### **Brief Biography:**

Professor Mammo Muchie did his undergraduate degree in Columbia University, New York, USA and his postgraduate MPhil and DPhil in Science, Technology, and Innovation for Development (STI&D) from the University of Sussex, UK. He is currently a DST-NRF research chair in Innovation Studies at the Faculty of Engineering and the Built Environment, Tshwane University of Technology as a rated research Professor. He is a fellow of the South African Academy of Sciences, the African Academy of Sciences and the African Science Institute. He is also currently adjunct Professor at Bahir Dar, Harmaya, and University of Gondar, Ethiopia. He is senior research associate fellow at the TMD Centre of Oxford University and the Africa Centre of Excellence in Data Science at the University of Rwanda. He has taught at the University of Economics in Prague as visiting professor, Jawarahal Nehru University in India, Tonji and Shanghai University in China; Honorary Professor Jiaxing University in China, Assistant Professor Amsterdam University, Visiting Professor Carleton College in the USA; Principal Lecturer Middlesex University, Professor Aalborg University; Part-time Lecturer, Cambridge University; Honorary Professor UNISA. Professor Mammo held various positions globally, including the Director of the Research Program on Civil Society and African Integration at the then University of Kwa Zulu-Natal; board member at the North Western University, Chengdu, China. He is currently the chairman of the advisory board of African Talent hub of the Community Interest Company (registration no.10461990) to raise funds for making Africa the talent, innovation, entrepreneurship, creativity and knowledge hub of the world. He has been appointed as special distinguished advisor to the Africa Union's Student Council and a mentor for the African Entrepreneurship award. He has initiated the African Unity for Renaissance and Knowledge Exchange. He is a founding scientific advisor to the African Solar network, founding chairman of the Network of Ethiopian scholars. He has led the SIDA, Sweden funded research on engineering design and on transformative innovation for African integrated development and educate on public media to speed up the creation of innovative and renaissance Africa. He is also a co-founding member of the Nano Technology Institute in TUT leading the innovation side of the research. He is the founder as Chief Editor of the African Journal on Science, Technology, Innovation and Development that has been running since 2009. He has been appointed as a scientific and academic advisor to the local e-Governance research that involved ten African countries on ICT4D. He had been appointed as a consultant on UNESCO's higher education, Research and Knowledge forum. He has served as a postdoctoral mentor in the NRF national postdoctoral forum. Since 1985, he has produced over 475 publications, including books, chapters in books, and articles in internationally accredited journals and entries in institutional publications. Prof. Muchie has been given a number of awards: long dedicated and valued service awards, best institutional senior researcher of the year merit, academic excellence award, and outstanding contribution to Science, Engineering, Technology (SET) and innovation by NTSF in South Africa. Prof. Muchie took up the mammoth task of producing an impressive body of research on the innovation systems (in whatever rudimentary forms or degrees of evolutionary state they exist) in various African countries. He is the founder of the Africana Post-Graduate Academy.

## CONFERENCE PROGRAM

### General Program Outline

Day	08:30-10:10	10:10-10:40	10:40-12:00	12:00-13:00	13:00-14:00	14:00-17:30	17:30-19:00
<b>Friday, Nov. 1, 2024</b>					Registration	Opening [Non-Technical] and Plenary/keynote	Cocktail
<b>Saturday, Nov. 2, 2024</b>	Parallel Technical sessions	Coffee break	Parallel technical sessions	Lunch break		Parallel technical sessions	Conference dinner and Closing session
<b>Sunday, Nov. 3, 2024</b>	Tour						

**Conference Opening Technical and Non-Technical Programs**  
**Friday, Nov. 1, 2024**  
**Time: 13:00-17:30**  
**Venue: Hall 3, Bahir Dar Institute of Technology**

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**Chair: Dr. Sisay Geremew**  
**Rapporteur:**

Time	Speakers	Moderator
14:00 -14:30	<b>Welcome</b> <b>Dr. Muluken Zegeye Getie</b> , <i>Deputy Scientific Director for Research and Technology Transfer</i>	Dr. Sisay G.
	<b>Welcome Message</b> <b>Dr. Mitiku Damtie Yehualaw</b> , <i>Scientific Director, Bahir Dar Institute of Technology</i>	
	<b>Dr. Mengesha Ayene</b> , <i>President, Bahir Dar University</i>	
14:30 -15:20	<b>Opening Keynote Speaker 1:</b> <b>Prof. Desta Mebratu</b> , <i>Professor at the Centre for Complex Systems in Transition (CST), Stellenbosch University, South Africa</i> <b>Title:</b> Systematic shifts for just and sustainable development in Africa	Dr. Sisay G.
15:20-16:35	<b>Opening Keynote Speaker 2:</b> <b>Dr. Dagnachew Aklog</b> , <i>Faculty of Civil and Water Resources, Bahir Dar Institute of Technology, Bahir Dar University, Ethiopia</i> <b>Title:</b> Water-Energy-Food Nexus in Ethiopia: The role of the academia in achieving sustainable development goals	Dr. Sisay G.
	<b>Opening Keynote Speaker 3:</b>	

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<b>16:35 -17:30</b>	<p align="center"><b>Prof. Mammo Muchie</b> <i>DST-NRF SARChI Chair Rated Research Professor in Innovation Studies, Tshwane University of Technology, South Africa</i> <b>Title:</b> Re-Thinking and Re-Designing Science, Technology, Engineering and Mathematics for Sustainable Development for All Humanity in one world Community Future</p>	Dr. Sisay G.
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**Parallel Sessions**  
**Saturday Nov. 2, 2024**  
**Time: 8:30 -17:30**

**Parallel Session I**  
**AI, ML and its Applications**  
**Venue: NDB3 (Smart classroom), Bahir Dar Institute of Technology**

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<b>Time: 8:30-11:20</b>	<p align="center"><b>Session Chair:</b> Dr. Debas Seneshaw <b>Rapporteur:</b> Mr. Alemu K</p>
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Time	Title and Authors
8:30-9:10	<p align="center">Keynote Speaker <b>Dr. Gebeyehu Belay</b> <i>Faculty of Computing , Bahir Dar Institute of Technology, Bahir Dar University</i> <b>Title:</b> <i>Augmenting Machine Learning Application for Amharic Speech Recognition: A paradigm of patient's Lips Motion Detection</i></p>
9:10-9:30	<p align="center"><b>Developing Bidirectional Harari-Amharic Machine Translation using a Deep Learning Approach</b> <i>Tessfu Geteye Fanatye and Mohammed Abdulkadir Ahmed</i></p>
9:30-9:50	<p align="center"><b>Analyzing the Efficacy of Machine learning models to detect Key - logger in safe and secure environments: A Comparative study</b> <i>Selvakumar Subramanian, Sheik Abdullah A, S.Geetha, Mohammad Abbas, Rishabh Banerjee</i></p>
9:50- 10:10	<p align="center"><b>Plant Leaf Diseases Detection Using Convolutional Neural Network</b> <i>Yirga Yayeh, Yenework Belayneh, Tamir Anteneh, Alemu Kumilachew</i></p>
10:10 – 10:40	<b>Coffee Break</b>
10:40-11:20	<b>Q &amp; A</b>
<b>Time: 11:20-17:10</b>	<p align="center"><b>Session Chair:</b> Dr. Mekonnen Wagaw <b>Rapporteur:</b> Mr. Abreham Debasu</p>
11:20-11:40	<p align="center"><b>Breaking Barriers in Amharic Speech Recognition: A Scalable End-to-End Approach</b> <i>Tesfa Tegegne Asfaw and Yohannes Ayana Ejigu</i></p>
11:40-12:00	<p align="center"><b>Human Activity Recognition Using Deep Learning Techniques</b> <i>Tamir Anteneh Alemu, Yirga Yayeh Munaye, Yenework Belayneh Checkol, Derejaw Lake Melie and Alemu Kumilachew Tegegne</i></p>
12:00 – 14:00	<b>Lunch Break</b>
	<b>Vibration imaging and two Dimensional Deep Convolutional Neural Network- Based</b>



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Bahir Dar University



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14:00-14:20	<b>intelligent Fault Diagnosis Method for Bearings under Varying Load Conditions and Unbalanced Health States</b> <i>Temesgen Tadesse Feisa, Hailu Shimels Gebremedhen, Fasikaw Kibrete Chomaw, and Dereje Engida Woldemichae</i>
14:20-14:40	<b>Haricot Beans Defect Classification Based on Hybrid Feature Extraction Approach</b> <i>Getachew Girma, Tilahun Asfaw, Arega Mulu</i>
14:40-15:20	<b>Q &amp; A</b>
15:20-15:50	<b>Coffee Break</b>
16:50-17:10	<b>Q &amp; A</b>
17:10-17:30	<b>Networking and award certificate</b>

**Parallel Session II**  
Advances in Electrical, Electronics and Computer Engineering  
**Venue: NDC1 (Smart classroom), Bahir Dar Institute of Technology**

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<b>Time: 8:30-12:10</b>	<b>Session Chair:</b> Dr. Mezgebu Getnet <b>Rapporteur:</b> Dr. Edmialem Gedefaye
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Time	Title and Authors
8:30-9:10	Keynote Speaker <b>Dr. Solomon Netsanet</b> <i>Electronet Group, New Zealand</i> <b>Title: Empowering Microgrids: Unveiling the Power of Machine Learning for Enhanced Automation and Intelligent Control</b>
9:10-9:30	<b>Microcontroller-Based System for Automatic Control of Vehicle Pedals to Prevent Drunk Driving</b> <i>Sewagegn Zewudie Tegegne, Dr Ramesh Babu Nallamotheu, Tadele Bishaw Achenef, Yibeltal Antehunegn Admas</i>
9:30- 9:50	<b>Voltage Stability Assessment of Distribution System Including Optimal Allocation of STATCOM</b> <i>Molla Addisu Mossie, Tefera Terefe Yetayew, Girmaw Teshager Bitew</i>
9:50 –10:10	<b>Q &amp; A</b>
10:10-10:40	<b>Coffee Break</b>
10:40 –11:00	<b>Q &amp; A</b>
11:00-11:20	<b>Power Loss Mitigation Case Study Using Unified Power Flow Controller</b> <i>Alebachew Kassie Anley, Yesuneh Getachew Taye, Estifanos Abeje Sharew, Molla Addisu Mossie</i>
11:20-11:40	<b>Modelling and Optimal Sizing of Off-Grid Solar-Wind Based Hybrid Energy System for Rural Electrification in Ethiopia: A Case Study in Somali Regional State, Ferfer Kebele</b> <i>Zerihun Shimelis Abebe, Mezigebu Getinet Yenealem</i>
11:40-12:10	<b>Q &amp; A</b>



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12:10 -14:00	<b>Lunch Break</b>
<b>Time: 14:00-17:00</b>	<b>Session Chair:</b> Dr. Amare Kassaw <b>Rapporteur:</b> Dr. Subramanian Selvakumar
14:00-14:20	<b>Genetic Algorithm-Based Fractional Order Controller Design for Electric Furnace Temperature Control in Glass Tempering Process</b> <i>Tefera Terefe Yetayew, Eyosya Ayele Gebrie, Gashaye Lewtie Hailu</i>
14:20-14:40	<b>Implementation of Adaptive Neuro-Fuzzy Inference System for Electric Power Consumption Prediction</b> <i>Molla Addisu Mossie, Estifanos Abeje Sharew , Alebachew Kassie Anley, Yesuneh Getachew Taye</i>
14:40-15:10	<b>Q &amp; A</b>
15:10-15:50	<b>Coffee Break</b>
15:50-16:10	<b>Cryptographic Key Generation via Deep Learning Using Bi-Modal Biometric Face and Fingerprint</b> <i>Tsehayu Gizachew, Subramanian Selvakumar</i>
16:10-16:30	<b>Performance Analysis of Gigabit Class MC-MB VLC System</b> <i>Netsanet Desalegn Misikir, Fikreselam Gared Mengistu</i>
16:30-17:00	<b>Q &amp; A</b>
17:00-17:30	<b>Networking and award certificate</b>

**Parallel Session III**  
Advancements in Manufacturing and Mechanization Systems  
**Venue: NDC3 (Smart classroom), Bahir Dar Institute of Technology**

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**Time: 8:30-12:00**      **Session Chair:** Dr. Geta Kidanemariam  
**Rapporteur:** Mr. Zelalem Masresha

Time	Title and Authors
8:30-9:10	Keynote Speaker 1 <b>Dr. Sisay Geremew</b> <i>Faculty of Mechanical and Industrial Engineering, Bahir Dar Institute of Technology, Bahir Dar University, Bahir Dar, P.O.Box 26 , Ethiopia</i> <i>CEO of Ovid Academy</i> <b>Title: Community engagement: An opportunity for building sustainable local partnership</b>
9:10-9:30	<b>Retaining Talent in Ethiopia's Booming Textile Industry: Key Drivers and Proposed Strategies</b> <i>Betseha Tizazu, Abebe Adgo, and Alebachew Mengistu</i>
9:30- 9:50	<b>Application of Ergonomics and Comparative Analysis of Traditional Farming Practice in Ethiopia</b> <i>Alebachew Mengistu Worku, Dr. Sisay Geremew Gebeyehu, Alehegn Melesse Semegn, Assefa Beyene Ayalew, Tamrat Yifter Meles</i>



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9:50-10:10	<b>Current Productivity Measurement Approaches and Evaluation of Productivity Factors for the Contemporary Flow Shop Manufacturing System</b> <i>Melkamu Ambelu, Abraham Debebe, Sisay Geremew</i>
10:10 – 10:40	<b>Coffee Break</b>
10:40-11:00	<b>Design, Development and Performance Investigation of Detachable Handle Electric Wheelchair</b> <i>Destaw Belete Mekonnen, Getnet Ayele Kebede, Birhanu Adisie Fentaw, Yalelet Tadesse Mtiku</i>
11:00-11:20	<b>Experimental study and mathematical modeling of thin layer drying kinetics of mango slice</b> <i>Hailemariam Mulugeta Wassie, Muluken Zegeye Getie, Molla Asmare Alemu, Bimrew Tamrat Admasu, Mulat Shitye Alem, Aschale Getnet Alemu, Henok Gebreyohannes Solomon, Abreham Alene Taye</i>
11:20-11:40	<b>Factors Affecting the Inventory Management System of Ethiopian Apparel Manufacturing Industries</b> <i>Betsha Tizazu Abreham and Zerihun Kebede</i>
11:40-12:00	<b>Finger millet production potential and the challenges of its traditional postharvest practices in West Gojam Zone, Amhara, Ethiopia</b> <i>Israel Endale Asres, Ermias Gebrekidan Koricho, Addisu Negash Ali, Mulugeta Admasu Delele, Geta Kidane Mariam</i>
12:00 – 14:00	<b>Lunch Break</b>
<div style="border: 1px solid black; padding: 5px; display: inline-block; margin-bottom: 5px;"><b>Time: 14:00-17:00</b></div> <b>Session Chair: Dr. Betsha Tizazu</b> <b>Rapporteur: Mr. Fetene Teshome</b>	
14:00-14:40	Keynote Speaker 2 <b>Dr. Bimerew Tamirat</b> <i>Faculty of Mechanical and Industrial Engineering, Bahir Dar Institute of Technology, Bahir Dar University, Bahir Dar, Ethiopia</i> <b>Title: Emerging technologies and innovations for sustainable manufacturing</b>
14:40-15:00	<b>High Frequency Induction Welding of Tube Pipe under Cold Roll Forming Process: Review</b> <i>Gashaw Desie Kemal, Mesay Alemu Tolcha, Teshome Mulatie Bogale, and Samuel Tesfaye</i>
15:00-15:20	<b>Influences of induced vibration during welding process on mechanical properties of weld joints: A comprehensive state-of-the-art review</b> <i>Samuel Belete Asfaw, Ermias Gebrekidan Koricho, and Teshome Mulatie Bogale</i>
15:20-15:50	<b>Coffee Break</b>
15:50-16:10	<b>Minimization of Goal Deviations in Bottling Industry using Lexicographic Programming Technique</b> <i>Zerihun Wondimu Lemessa, Assefa Beyene Ayalew, Bereket Haile Woldegiorgis, Alebachew Mengistu Worku</i>
16:10-16:30	<b>Parallel Hidden Layers Bi-Directional Long Short-Term Memory Framework with Hierarchical Attention Mechanisms for Fault Diagnosis of Rotating Machines</b> <i>Fasikaw Kibrete, Dereje Engida Woldemichael, Hailu Shimels Gebremedhen and Temesgen Tadesse Feisa</i>



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16:30-16:50	<b>A study of Barrier of Total Productive Maintenances Implementation (BTPMI) using Integrated approach of Fuzzified Interpretive Structural Modeling (FISM) and Structural Equation Modeling (SEM): A case specific Review</b> <i>Gedefaye Achamu, Betsha Tizazu, and Hunie Asrat</i>
16:50-17:00	<b>Q &amp; A</b>
17:00-17:30	<b>Networking/Refreshment Break</b>

**Parallel Session IV**  
Advances in Material Science and Applications  
**Venue: NDC4 (Smart classroom), Bahir Dar Institute of Technology**

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<b>Time: 8:30-12:00</b>	<b>Session Chair:</b> Dr. Tessera Alemneh <b>Rapporteur:</b> Dr. Abebaw Abun
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Time	Title and Authors		
8:30-9:10	Keynote Speaker 1 <b>Dr. Noto Susanto Gultom</b> <i>University of Padjadjaran, Department of Physics, Kabupaten Sumedang Jawa Barat 45363, Indonesia</i> <b>Title: Overall water splitting realized by sputtering technique : A green technology for green hydrogen production</b>		
9:10-9:30	<b>Evaluation of Sustainable Composite Materials using eggshell: Development and characterization</b> <i>Asmare Tezera Admase, Bereded Gedamu Eshetie, Ejigayehu Desalegn Asrade, Tesfa Nega Gesese</i>		
9:30- 9:50	<b>A Review on Recent Advances of Biomass Based Carbon Aerogels for Supercapacitor Electrodes</b> <i>Gedefaw Asmare Tafete, Nigus Gabbiye Habtu, Metadel Kassahun Abera, Temesgen Atnafu Yemata, Alemayehu Kifle Shibeshi, Nigus Worku Kebede</i>		
9:50-10:10	<b>Extraction and Characterization of Cellulose from Finger Millet Husk</b> <i>Amlaku Gizachew Mekonnen and Getinet Yenealem Ashebir</i>		
10:10 – 10:40	<b>Coffee Break</b>		
10:40-12:00	<b>Q &amp; A</b>		
12:00 – 14:00	<b>Lunch Break</b>		
<table border="1"> <tr> <td><b>Time: 14:00-17:00</b></td> <td><b>Session Chair:</b> Dr Addisu Alemayehu <b>Rapporteur:</b> Dr Solomon Ngedu</td> </tr> </table>		<b>Time: 14:00-17:00</b>	<b>Session Chair:</b> Dr Addisu Alemayehu <b>Rapporteur:</b> Dr Solomon Ngedu
<b>Time: 14:00-17:00</b>	<b>Session Chair:</b> Dr Addisu Alemayehu <b>Rapporteur:</b> Dr Solomon Ngedu		
14:00-14:40	Keynote Speaker 2 <b>Prof Delele Worku Ayele</b> <i>Bahir Dar University, College of Science, Chemistry Department, Bahir Dar, Ethiopia</i> <b>Title: Development of metal air battery</b>		
14:40-15:00	<b>Improving Structural Integrity of Magnesium: The Influence of Hydroxyapatite on Tantalum and Hydroxyapatite Reinforced Magnesium</b> <i>Tewodros Semeneh Ayalew, Aschale Getnet Alemu, Hailemariam Mulugeta Wassie</i>		

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15:00-15:20	<b>Synthesis and characterization of glucose syrup through acid hydrolysis</b> <i>Tesfa Nega Gesese , Desalegn Abera Mersha, Asmare Tezera Admase, Ejigayehu Dealegn Asrade , Alelgn Anmaw Getahun, Atrsaw Jejaw Bezie, Behailu Bisenebt Mosse, Alebel Abebaw Teshager</i>
15:20-15:50	<b>Coffee Break</b>
15:50-16:10	<b>Solar Water Disinfection Assisted with Photochemical Additives: A Sustainable Approach</b> <i>Desalegn Abera, Metadel Kassahun, Anna Melekhova, Ljiljana Fruk</i>
16:10-17:00	<b>Q &amp; A</b>
17:00-17:30	<b>Networking/Refreshment Break</b>

**Parallel Session V**  
Process Industries for Sustainable Development  
**Venue: NDC5 (Smart classroom), Bahir Dar Institute of Technology**

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<b>Time: 8:30-12:00</b>	<b>Session Chair:</b> Professor Nigus Gabiye <b>Rapporteur:</b> Dr. Tesfay Alamirew
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Time	Title and Authors		
8:30-9:10	Keynote Speaker 1 <b>Dr. Zenamarkos Bantie</b> <i>Chemical and Food Engineering Faculty, Bahir Dar Institute of Technology, Bahir Dar University</i> <b>Title: Miniaturization - Nanotechnological Approach: State of the art and Perspectives</b>		
9:10-9:30	<b>Synthesis, Characterization, and Applications of Natural pigments: A review</b> <i>Ejigayehu Desalegn Asrade, Asmare Tezera Admase, Fekadu Mazengiaw Bogale, Tesfa Nega Gesese, Desalegn Abera Mersha</i>		
9:30-9:50	<b>Finite volume method Analysis of Thermo-hydraulic performance comparison of series and parallel multi-shell multi-helical coiled tube heat exchangers</b> <b>Amare Tesfaw Addis, Olawale Samuel Fatoba, Bimrew Tamrat Admasu, Muluken Zegeye Getie</b>		
9:50- 10:10	<b>Quantitative Analyses of Phytochemicals and Antioxidant Activity in Acokenthera Schimperii plant Leaves: Development of Optimized Extraction Protocol</b> <i>Elsabeth Tsegaye, Nigus Gabbiye Habtu, Zenamarkos Bantie, Metadel Kassahun Abera, Yalew Woldeamanuel</i>		
10:10 – 10:40	<b>Coffee Break</b>		
10:40-12:00	<b>Q &amp; A</b>		
12:00 – 14:00	<b>Lunch Break</b>		
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<b>Time: 14:00-16:30</b>	<b>Session Chair:</b> Dr. Aynadis Molla <b>Rapporteur:</b> Mr. Biresaw Demelash		
14:00-14:40	Keynote Speaker 2 <b>Dr. Mesfin Wogayehu</b> <i>Chemical and Food Engineering Faculty, Bahir Dar Institute of Technology, Bahir Dar University</i>		



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	<b>Title: The Role of Food Processing in Food and Nutrition Security: Alignment with Policy Directions</b>
14:40-15:00	<b>Effect of Application of Onion Paste on Dough for Enhancing Shelf Life and Sensory Properties of Bread</b> <i>Zemenu Tadesse Adimas, Mekuannt Alefe Adimas, Biresaw Demelash Abera</i>
15:00-15:20	<b>Process optimization and quality evaluation of pearl millet and wheat composite flour bread</b> <i>Tadesse Fenta Yehuala, Aregash Mamo Gizaw, Metadel Kassahun Abera, Hirut Assaye Cherie, Minaleshewa Atlabachew, Tadelle Nigusu Mekonnen, Gizaw Desta, Wanjiku Gichohi</i>
15:20-15:50	<b>Coffee Break</b>
15:50-16:10	<b>Effect of blending ratio on physicochemical and sensory quality of bread from wheat and white lupine (L. albus) composite flour</b> <i>Behailu Bisenebit Mossie, Biresaw Demelash Abera</i>
16:10-16:30	<b>Q &amp; A</b>
16:30-17:30	<b>Networking and award certificate</b>

**Parallel Session VI**  
Renewable and Green Energy Technologies  
**Venue: NDC6 (Smart classroom), Bahir Dar Institute of Technology**

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**Time: 8:30-12:00**      **Session Chair: Dr. Eshetu Getahun**  
**Rapporteur: Mr. Atrsaw Jajew**

Time	Title and Authors
8:30-9:10	Keynote Speaker <b>Dr. Ababay Ketema</b> <i>Bahir Dar Energy Center, Bahir Dar Institute of Technology, Bahir Dar University</i> <b>Title: Advanced Batteries and Supercapacitors: A Novel Power Storage Option for Sustainable Energy Development</b>
9:10-9:30	<b>Estimation of the Biogas Production Potential of Specific Food Waste Mixtures</b> Menber Berihun Nigatu
9:30-9:50	<b>Advancements and outlooks of biomass cookstoves: A review</b> <i>Mulat Shitye Alem, Muluken Zegeye Getie, Molla Asmare Alemu, Muluken Temesgen Tigabu, Hailemariam Mulugeta Wassie</i>
9:50- 10:10	<b>Experimental investigation of the performance of a so-lar-powered direct evaporative cooler using a chiller: Case study Bahir Dar, Ethiopia</b> <i>Aschale G. Alemu, Atrsaw J. Bezie, Tereche G. Tesfa, Muluken Z. Getie, Molla A. Alemu, Hailemariam M. Wassie, Desalegn A. Mersha, Mulat S. Alem, Yabebal C. Mihret, Tewodros S. Ayalew</i>
10:10 – 10:40	<b>Coffee Break</b>
10:40-11:20	<b>Q &amp; A</b>
11:20-11:40	<b>A comprehensive review of the photovoltaic panel cooling technique for improved efficiency</b> <i>Hailemariam Mulugeta Wassie, Kassa Enawgaw Kassie, Muluken Zegeye Getie</i>



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11:40-12:00	<b>Q &amp; A</b>
12:00 – 14:00	<b>Lunch Break</b>
<b>Time: 14:00-17:10</b>	<b>Session Chair: Dr. Dawit Tessema Rapporteur: Mr. Tesfa Nega</b>
14:00-14:20	<b>Enhancing hydrolysis products from corncob biomass via Microwave assisted deep eutectic solvents pretreatment</b> <i>Sinework Fenetabeil, Nigus Gabbiye Habtu, Molla Asmare</i>
14:20-14:40	<b>Renewable Energy Resources in Ethiopia for Green Economy from Practical Insights: Policy Review, Challenges and Opportunities</b> <i>Ibsa Aliyi Usmane, Bobe Bedadi Worka, Kemal Kasim Ahmed, Lelisa Shamsadin Mohammed</i>
14:40-15:00	<b>Experimental Study of a Flat Plate Solar Collector Performance with Spiral Pipes and Nano-Fluids</b> <i>Mulat Shitye Alem, Hailegiorgis Nigatu Asres, Muluken Zegeye Getie, Bimrew Tamirat Admasu, Molla Asmare Alemu, Hailemariam Mulugeta Wassie, Million Abebe Mekuriya.</i>
15:00-15:20	<b>Q &amp; A</b>
15:20-15:50	<b>Coffee Break</b>
15:50-16:10	<b>Advancing Injection Timing for Enhanced Performance and Reduced Emissions in Direct Injection Diesel Engines Using Diesel-Biodiesel-Ethanol Blends</b> <i>Dr. Rajendiran Gopal, Dr. K. Mayilsamy, Dr. R. Subramanian, Dr. N. Nedunchezian and Dr. R. Venkatachalam, R</i>
16:10-16:30	<b>Integrating Geothermal Waste Heat into Solar Chimney Power Plant Design for Improved Performance</b> <i>Tereche Getnet Tesfa, Aschale Getnet Alemu</i>
16:30-16:50	<b>Recent advances in biochemical, thermochemical, and hybrid conversion approaches for biofuel production from lignocellulosic biomass: A Review</b> <i>Wondmagegn Wonago Kululo, Nigus Gabbiye Habtu, Metadel Kassahun Abera, and Zenamarkos Bantie Sendekie, Solomon Workneh Fanta, Temesgen Atnafu Yemata</i>
16:50-17:10	<b>Q &amp; A</b>
17:10-17:30	<b>Networking and award certificate</b>

**Parallel Session VII**  
Sustainable Infrastructure and Built Environment  
**Venue: NDD1 (Smart classroom), Bahir Dar Institute of Technology**

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**Time: 8:30-12:00**

**Session Chair: Dr. Mrs. Misrak Tefera  
Rapporteur: Mr. Begashaw Worku**

Time	Title and Authors
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8:30-9:10	<p align="center"><b>Session Keynote Speaker 1</b> <i>Dr. Habtamu M. Zelelew</i> <i>ET Online College, Ethiopia</i></p> <p><b>Title:</b> Advancements in Material Testing, Characterization, Modeling and Future Implications: Ethiopian Context</p>
9:10-9:30	<p align="center"><b>Investigating the Effect of Recycled Asphalt Pavement Aggregate and Bitumen Modified with Waste-Water Plastic Bottles (PET) on Mechanical Properties of Hot Mix Asphalt Mixture</b> <i>Gashaw Bahiru Teka, Mitiku Damtie Yehualaw (PhD), Yohannes Sisay Zeleke, Begashaw Worku Yifru</i></p>
9:30- 9:50	<p align="center"><b>Investigating Recycled Aggregate Concrete: An Experimental Study Utilizing Recycled Fine Aggregate and Steel Slag</b> <i>Worku Tilahun Tsega, Mitiku Damtie Yehualaw, Begashaw Worku Yifru, Wallelign Mulugeta Nebiyu</i></p>
9:50-10:10	<p align="center"><b>Investigating effect of crumb rubber using as an aggregate in the hot mix asphalt mixture properties</b> <i>Yohannes Sisay Zeleke and Dereje Birhanu Tsegaye</i></p>
10:10 – 10:40	<b>Coffee Break</b>
10:40-11:00	<p align="center"><b>Compressive and Splitting Tensile Strength Performance of Self-Compacting Mortar with Crushed Blood Clam Shells as Partial Replacement of Natural Fine Aggregate</b> <i>Herry Suryadi Djayaprabha and Timotius Effendy</i></p>
11:00-11:20	<p align="center"><b>Review on Green Solutions: The Role of Bio-Enzymes in Sustainable Construction</b> <i>Bahiru Bewket Mitikie, Walied A. Elsaigh</i></p>
11:20-11:40	<p align="center"><b>Evaluating the Impact of Aggregate Surface Area on Hot Mix Asphalt Performance</b> <i>Wallelign Mulugeta Nebiyu, Yibeltal Aychew Beyene, Melaku Sisay Abebe, Yared Aklilu Alem</i></p>
11:40-12:00	<p align="center"><b>Impact of Predictive Analytics (PA), Artificial Intelligence (AI), and Digital Twin (DT) on Construction Planning and Scheduling</b> <i>Abreham Desta, and Belachew Asteray</i></p>
12:00 – 14:00	<b>Lunch Break</b>
<p><b>Time: 14:00-16:50</b></p> <p align="center"><b>Session Chair:</b> Dr. Mulugeta Azeze <b>Rapporteur:</b> Dr. Hanibal Lemma</p>	
14:00-14:40	<p align="center">Session Keynote Speaker 2 <i>Dr. Fasikaw A. Zimale</i> <i>Faculty of Civil and Water Resource Engineering, Institute of Technology, Bahir Dar University, Ethiopia</i></p> <p><b>Title:</b> Trends in Hydrological Research and Methodologies to Address Water</p>

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	<b>Resource Challenges</b>
14:40-15:00	<b>Assessing Challenges and Solutions for Public Transportation in Bahir Dar City</b> <i>Nakachew Assefa Kebede, Daniel Amsalu Ayele, Yohannes Sisay Zeleke and Tesfahun Nigatu Wolie</i>
15:00-15:20	<b>Structural Investigation and Strengthening Measures: A Case Study of a Dormitory Building in Bahir Dar, Ethiopia</b> <i>Temesgen W. Cherie, Biruk Y. Lemlem, Seto M. Haile, Alemayehu G. Gualu</i>
15:20-15:50	<b>Coffee Break</b>
15:50-16:10	<b>GIS and Remote Sensing based Agricultural Land Suitability Analysis in South Gondar Zone, Ethiopia</b> <i>Weldehana Aweke, Abebech Beyene, Zigiysel Firiew, Chalachew Abebe</i>
16:10-16:30	<b>Dynamics and impact of <i>Eucalyptus</i> plantations on water availability in a monsoon climate: a case study of Amen, Ethiopia</b> <i>Habtamu M. Fenta, Tammo S. Steenhuis, Fasikaw A. Zimale, Teshager A. Negatu, Seifu A. Tilahun</i>
16:30-17:00	<b>Q &amp; A</b>
17:00-17:30	<b>Networking/Refreshment Break</b>

**Exhibition and Poster**

Nov. 1-3, 2024

Time: 8:30 -17:30

Venue: Hall 3, Bahir Dar Institute of Technology