**CRITICAL INFRASTRUCTURES**

**IN DIGITAL WORLD – 2025**

**WORKSHOP****PROGRAMME**

**March 13, 10:00 Thursday**

**Departure from Irkutsk at 10:00**

**Arrival** **in Bolshoe Goloustnoe**

**March 13, 20:00 OPENING CEREMONY**

**Welcome Party**

**March 19, 10:00 Wednesday**

**Departure of the participants to Irkutsk**

**March 14, 10:00 Friday**

**OPENING OF THE WORKSHOP**

**March 14, 10:15 Friday**

**SESSION 1**

1. Digital platform of knowledge ecosystem in energy / **Massel Liudmila** *(Melentiev Energy Systems Institute SB RAS, Irkutsk, Russia)*

2. Experience in building neuroassistants for a knowledge ecosystem / **Melnikov Andrey** *(Yugra research Institute of information technologies, Khanty-Mansiysk, Russia)*

3. Situational awareness for power system operation using state estimator / **Kolosok Irina,** Korkina Elena *(Melentiev Energy Systems Institute SB RAS, Irkutsk, Russia)*

4. Evaluation of efficiency of hybrid systems with solar panels based on queuing theory / Tyulenina Yana, Meloshnikova Natalia, **Fedorova Ekaterina** *(National Research Tomsk State University, Tomsk, Russia)*

5. Methodological features of the threats impact study on the reliability of energy supply in modern conditions / **Pyatkova Natalia**, Mamedov Timur *(Melentiev Energy Systems Institute SB RAS, Irkutsk, Russia)*

6. Electricity consumption in data centers: current status and forecasts / **Galperova Elena**, Galperov Vasilii *(Melentiev Energy Systems Institute SB RAS, Irkutsk, Russia)*

7. Application of large language models for constructing formalized ontological models / **Massel Aleksei** *(Melentiev Energy Systems Institute SB RAS, Irkutsk, Russia)*

8. Features of neuro-assistants design in the knowledge ecosystem / **Alekseev Roman1**, Lukianov Nikita2, Massel Liudmila1

1Melentiev Energy Systems Institute SB RAS, Irkutsk, Russia

2Irkutsk National Research Technical University, Irkutsk, Russia

**March 14, 14:00 Friday**

**BAIKAL HOVERCRAFT TRIP**

**March 14, 17:00 Round Table Friday**

**KNOWLEDGE ECOSYSTEM: METHODS OF CONSTRUCTION AND APPROACHES TO IMPLEMENTATION**

**Moderator: Melnikov Andrey**

1. Hype or well-deserved laurels: a critical analysis of the successes of generative artificial intelligence / **Gavrilova Tatiana** (оn-line) *(Higher School of Economics, Saint Petersburg, Russia)*

2. Visualization methods and tools for knowledge ecosystem in energy / **Mikheev Aleksei** *(Melentiev Energy Systems Institute SB RAS, Irkutsk, Russia)*

3. Digitalization of energy supply and energy consumption in the housing sector / **Zoryna Tatsiana** (оn-line) *(Institute of Power Engineering, National Academy of Sciences of Belarus, Minsk, Republic of Belarus)*

**March 15, 10:00 Saturday**

**SESSION 2**

1. Computational technologies of phase estimation / **Gornov Alexander** *(Matrosov Institute for System Dynamics and Control Theory of SB RAS, Irkutsk, Russia)*

2. Application of swarm intelligence algorithms to solve the discrete problem of atomic-molecular modeling using the Morse potential / **Sorokovikov Pavel** *(Matrosov Institute for System Dynamics and Control Theory of SB RAS, Irkutsk, Russia)*

3. Parallel version of the curvilinear variational method for nonconvex extremal problems / **Anikin Anton**, Zarodnyuk Tatiana *(Matrosov Institute for System Dynamics and Control Theory of SB RAS, Irkutsk, Russia)*

4. Investigation of age dynamics of population mortality of the industrial center from diseases of the circulatory system during the pandemic / **Efimova Natalia**1, Zarodnyuk Tatiana2

1East-Siberian Institute of Medical and Ecological Research, Angarsk, Russia

2Matrosov Institute for System Dynamics and Control Theory of SB RAS, Irkutsk, Russia

5. Subjective assessment by laboratory staff of the medical information system at the stage of its implementation / **Kuz'menko Vladimir**1, Gornov Alexander2

*1ISMAPgE – Branch Campus of the FSBEI FPE RMACPE MOH Russia, Irkutsk, Russia*

*2Matrosov Institute for System Dynamics and Control Theory of SB RAS, Irkutsk, Russia*

6. Adaptation of ICS WICS to study of the resilience of energy and socio-ecological systems / **Kuzmin Vladimir** *(Melentiev Energy Systems Institute SB RAS, Irkutsk, Russia)*

7. Approaches to modeling the Irkustsk region power system in the study of energy security / **Shchukina Victoria** *(Irkutsk National Research Technical University, Irkutsk, Russia)*

8. Modeling of individual performance indicator of researchers / **Tuktarova Polina** *(Melentiev Energy Systems Institute SB RAS, Irkutsk, Russia)*

**March 15, 17:00 DISCUSSION**  **Saturday**

Discussion of the dissertation **MATHEMATICAL MODELS AND** **ALGORITHMS FOR SOLVING PROBLEMS OF COATING AND PACKING FOR SURFACES OF REVOLUTION** for the degree of candidate of physical and mathematical sciences (1.2.2)

Nguyen Duc Minh

Irkutsk National Research Technical University, Irkutsk, Russia

Discussion of the dissertation **NON-STATIONARY MODELS AND METHODS OF QUEUEING THEORY IN THE STUDY OF TRANSPORT AND LOGISTICS HUBS** for the degree of candidate of technical sciences (1.2.2)

Vu Hoang Giang

Irkutsk National Research Technical University, Irkutsk, Russia

 Supervisor: **Kazakov Alexander**

Matrosov Institute for System Dynamics and Control Theory of SB RAS, Irkutsk, Russia

**March 15, 18:00 Round Table Saturday**

**MATHEMATICS AND DIGITALIZATION**

***Moderator:* Gornov Alexander**

Digital health literacy: Russian problems / **Dyakovich Marina** *(Angarsk State Technical University, Angarsk, Russia)*

**March 15, 19:00 Workshop Party Saturday**

**March 16, 10:00 Sunday**

**SESSION 3**

1. Architecture of a cloud platform for storage and processing of magnetotelluric sounding monitoring data / **Chernykh Aleksei**1, Rukosuev D.A.1,2, Shelokhov I.A.1,2, Buddo I.V.1,2

1Institute of the Earth’s Crust SB RAS, Irkutsk, Russia

2Irkutsk National Research Technical University, Irkutsk, Russia

2. Development of the web version of «INTEC-A» as a component of the digital platform of the knowledge ecosystem in the energy sector / **Mamedov Timur** *(Melentiev Energy Systems Institute SB RAS, Irkutsk, Russia)*

3. Optimization of food products production taking into account the features of the activities of the producer / **Ananyev Leonid**, Ivanyo Yaroslav, Petrova Sofia *(Irkutsk State Agrarian University, Molodezhny, Irkutsk district, Russia)*

4. Model of optimization of land use in pasture livestock husbandry / **Ariunjargal Enkhbat**, Ivanyo Yaroslav *(Irkutsk State Agrarian University, Molodezhny, Irkutsk district, Russia)*

5. Modeling the efficiency of university activities using an electronic information and educational environment / **Baymakov Aleksander**, Ivanyo Yaroslav, Klimov Egor, Fedurina Nina *(Irkutsk State Agrarian University, Molodezhny, Irkutsk district, Russia)*

6. Multilevel modeling of crops productivity in assessing the features of extreme years / **Klimov Egor**, Ivanyo Yaroslav, Petrova Sofia *(Irkutsk State Agrarian University, Molodezhny, Irkutsk district, Russia)*

7. Artificial intelligence in monitoring the condition of animals in pastoral livestock farming / **Vashukevich Evgenii**, Ivanyo Yaroslav *(Irkutsk State Agrarian University, Molodezhny, Irkutsk district, Russia)*

8. Data monitoring in modeling agricultural production / **Zamaraev Aleksei**, Ivanyo Yaroslav, Chernigova Dina *(Irkutsk State Agrarian University, Molodezhny, Irkutsk district, Russia)*

**March 16, 14:00 Sunday**

**BAIKAL HOVERCRAFT TRIP**

**TO PESCHANAYA BAY**

**March 17, 10:00 Monday**

**SESSION 4**

1. Advantages of using the knowledge ecosystem in the energy sector / **Lezin Alexander**, Massel Liudmila *(Melentiev Energy Systems Institute SB RAS, Irkutsk, Russia)*

2. Software and computing tools for analyzing the dynamics of scientific and technological topics as components of the knowledge ecosystem / **Karimov Nikolai**, Mikheev Aleksei *(Melentiev Energy Systems Institute SB RAS, Irkutsk, Russia)*

3. Development of components of a software and computational toolkit of dynamic cognitive modeling for the knowledge ecosystem in the energy sector / **Kozlov Maksim**1,2, Mikheev Aleksei1

1Melentiev Energy Systems Institute SB RAS, Irkutsk, Russia

2Irkutsk National Research Technical University, Irkutsk, Russia

4. Composition and meta descriptions of the knowledge warehouse components for energy research / **Vorozhtsova Tatiana** *(Melentiev Energy Systems Institute SB RAS, Irkutsk, Russia)*

5. Principles of organizing an ontological knowledge portal within the framework of a digital platform of knowledge ecosystem / **Pesterev Dmitrii** *(Melentiev Energy Systems Institute SB RAS, Irkutsk, Russia)*

6. Ontological model of methods and approaches to the development of digital twins / **Gaskova Daria**, Massel Aleksei *(Melentiev Energy Systems Institute SB RAS, Irkutsk, Russia)*

7. Applying machine learning methods to process data from a digital knowledge ecosystem platform / **Tsibikov Aleksey** *(Melentiev Energy Systems Institute SB RAS, Irkutsk, Russia)*

8. Visualization component as one of the basic components of the digital twin in the digital platform of the knowledge ecosystem / **Shchukin Nikita**, Massel Liudmila *(Melentiev Energy Systems Institute SB RAS, Irkutsk, Russia)*

**March 17, 17:00 Monday**

**SESSION 5 (on-line)**

1. What are the advantages of using knowledge graphs in semantic description of a subject area? / Ataeva Olga, **Tuchkova Natalia** (*Federal Research Center «Informatics and Management», Moscow, Russia)*

2. A platform for the development of intelligent personalized medical information systems / **Ustyugov Vladislav** *(Novosibirsk State University, Novosibirsk, Russia)*

3. Analysis of database integration challenges in air transport: technological and methodological aspects / **Litvinova Oksana**, Arshinskiy Leonid *(Irkutsk State Transport University, Irkutsk, Russia)*

**March 18, 10:00 DISCUSSION Tuesday**

Conceptual framework for logging a complex accounting information system / **Erzhenin Roman** *(LLC “KRISTA-IRKUTSK”, Irkutsk, Russia)*

Discussion of the dissertation **METHODOLOGICAL APPROACH TO CONSTRUCTING DIGITAL TWINS OF RENEWABLE ENERGY SOURCES USING SEMANTIC MODELLING** for the degree of candidate of technical sciences (1.2.2)

Shchukin Nikita

Melentiev Energy Systems Institute SB RAS, Irkutsk, Russia

Discussion of the dissertation **DEVELOPING SMART DIGITAL TWINS IN ENERGY USING MACHINE LEARNING METHODS** for the degree of candidate of technical sciences (1.2.2)

Tsibikov Aleksey

Melentiev Energy Systems Institute SB RAS, Irkutsk, Russia

Supervisor: **Massel Liudmila**

Melentiev Energy Systems Institute SB RAS, Irkutsk, Russia

Discussion of the dissertation **METHODS, MODELS AND TOOLS FOR INTELLIGENT DECISION SUPPORT IN PREDICTIVE RESEARCH OF THE FUEL AND ENERGY COMPLEX** for the degree of candidate of technical sciences (1.2.2)

Mamedov Timur

Melentiev Energy Systems Institute SB RAS, Irkutsk, Russia

Supervisor: **Massel Aleksei**

Melentiev Energy Systems Institute SB RAS, Irkutsk, Russia

**FINAL DISCUSSION**

**March 18, 20:00 CLOSING CEREMONY**

**Farewell Party**

**March 19, 10:00 Wednesday**

**Departure of the participants to Irkutsk**