

## VIII International conference



# BALTTRIB' 2015

## CONFERENCE PROGRAMME

**Aleksandras Stulginskis University**  
Akademija, Kaunas

**26-27 November 2015**

**Conference venue:**

4<sup>th</sup> building of Aleksandras Stulginskis University (ASU)  
Universiteto 8A, Akademija  
LT-53345 Kauno r.  
LITHUANIA

**Contacts:**

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## CONFERENCE ORGANISED BY:



Aleksandras Stulginskis University



Lithuanian Scientific Society Department „Tribologija“



International Tribology Council

### Conference topics:

- Friction and wear of friction pairs in agricultural, transport and industrial machinery;
- Lubrication;
- Micro- and nano-scale tribology;
- Tribochemistry;
- Bio-tribology;
- Environmental issues in tribology;
- Surface science and coating engineering;
- Tribology in metal processing;
- Simulation of tribological processes;
- Experimental methods in tribology.

### Address:

International Conference “BALTTTRIB’2015”  
Institute of Power and Transport Machinery Engineering  
Aleksandras Stulginskis University (ASU)  
Studentu 15, Akademija  
LT-53362 Kauno r.  
LITHUANIA

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Internet: <http://www.balttrib.info>

## Conference programme

Venue: 4<sup>th</sup> Building of ASU, Universiteto 8A, Akademija

### 26 November 2015

- 07:30 Registration 4<sup>th</sup> Building of ASU, lobby  
09:00 **Opening Session** Conference Hall (Room 214)  
09:30 **Plenary Session** Conference Hall (Room 214)  
12:00 Coffee break  
12:30 **Poster presentations**  
13:30 Lunch  
14:30 **Scientific sections**  
Section 1 Surface processing and surface science Conference Hall (Room 214)  
Section 2 Tribological materials Room 211  
16:30 Coffee break  
17:00 **Scientific sections**  
Section 3 Friction and wear in tribosystems Conference Hall (Room 214)  
Section 4 Lubricants and lubrication Room 211  
19:00 Get together (Lobby, 1<sup>st</sup> floor)

### 27 November 2015

- 09:00 **Plenary Session** Conference Hall (Room 214)  
11:30 Coffee break  
12:00 **Exhibition** (presentations of enterprises)  
13:00 **Discussions; Closing remarks**  
13:15 Lunch  
14:00 **Tour to Tribology laboratory** at the Institute of Power and Transport Machinery Engineering and **Open access research centre** at the ASU  
15:30 Free time in Kaunas downtown.

## Cultural programme

### 27 November 2015

- 18:00 Performance at Kaunas Philharmonic

### 28 November 2015

- 07:30 Departure for **Cultural programme in Northern Lithuania**  
  
19:00 Return to 4<sup>th</sup> building of ASU.

#### **REMARK:**

Participation in cultural programme (tickets for Kaunas State Philharmonic and cultural programme in Northern Lithuania) is charged separately from conference fee. Content of cultural programme is presented at the end of the conference programme.

# PLENARY LECTURES

**26 November 2015**

09:30 – 12:00 Conference Hall of 4<sup>th</sup> building of ASU (Room 214)

Chairmen: **R. Rukuiža**, Co-chairman **J. Padgurskas**

## **POLYMER COMPOSITES IN TRIBOLOGY**

**N.K. Myshkin**, S.S. Pesetskii, A.Ya. Grigoriev, V.A.Belyi *Metal Polymer Research Institute of National Academy of Sciences of Belarus, Belarus*

## **RUNNING-IN PHENOMENA IN LUBRICATED METAL-METAL CONTACTS**

**M. Scherge**, *Fraunhofer Institute for Mechanics of Materials IWM, Germany*

## **THE BENEFICIAL EFFECT OF GRAPHENE NANOFILLERS ON THE TRIBOLOGICAL PROPERTIES OF CERAMICS**

**M. Belmonte**, J. Llorente, M. I. Osendi, P. Miranzo, *Institute of Ceramics and Glass (ICV-CSIC), Spain*

## **METHOD OF DIMENSIONALITY REDUCTION IN CONTACT MECHANICS: APPLICATIONS FOR STRUCTURAL DAMPING, WEAR AND ADHESION**

**V. L. Popov**, M. Heß, *Berlin University of Technology, Germany*, M. Popov, *Berlin University of Technology, Germany, National Research Tomsk Polytechnic University, Russia*

**27 November 2015**

09:00 – 11:30 Conference Hall of 4<sup>th</sup> building of ASU (Room 214)

Chairmen: **A.V. Radulescu**, Co-chairman **S. Asadauskas**

## **TRIBOLOGICAL EVALUATION OF HARD COATINGS FOR PIEZOELECTRIC MOTORS**

**R. Rukuiža**, J. Padgurskas, A. Žunda, A. Andriušis, V. Jankauskas, *Aleksandras Stulginskis University, Lithuania*

## **THEORETICAL CALCULUS MODEL FOR THE FINITE LENGTH RAYLEIGH STEP BEARINGS LUBRICATED WITH GREASES**

**A. V. Radulescu**, *University "POLITEHNICA" Bucharest, Romania*

## **WEAR BY FRICTION ANALYSIS OF NITRIDED AND CARBURIZED CONSTRUCTIONAL STEELS**

**J. Senatorski**, J. Tacikowski, P. Mączyński, *Institute of Precision Mechanics, Poland*

## **EFFECT OF MICROSTRUCTURE ON ABRASIVE WEAR BEHAVIOUR**

**B. Narayanaswamy**, P. Hodgson, H. Beladi, *Deakin University, Australia*

# SCIENTIFIC SECTIONS

26 November 2015

## Section 1

### Surface processing and surface science

14:30 – 16:30

Conference Hall (Room 214)

Chairmen: **N.K. Myshkin**, Co-chairman **A. Žunda**

#### **EFFECT OF BULK CURRENT DENSITY ON TRIBOLOGICAL PROPERTIES OF Fe-W, Co-W AND Ni-W COATINGS**

S.A. Silkin, A.V. Gotelyak, **N. Tsyntaru**, A.I. Dikumar, *Institute of Applied Physics, Moldova*, R. Kreivaitis, J. Padgurskas, *Aleksandras Stulginskis University, Lithuania*

#### **COMPARING SURFACE ROUGHNESS AND TEXTURE CONCEPTS**

**A.Ya. Grigoriev**, N.K. Myshkin, *Metal-Polymer Research Institute, Belarus*

#### **THE WEAR RESISTANCE OF THE ELECTROSPARK COATINGS PREPARED ON STEEL 45, TESTED WITH COUNTERBODIES FROM DIVERSE MATERIALS**

V. Agafii, V. Mihailov, N. Kazak, *Institute of Applied Physics, Moldova*, J. Padgurskas, A. Andriušis, **R. Kreivaitis**, *Aleksandras Stulginskis University, Lithuania*

#### **TRIBOLOGICAL BEHAVIOUR OF Co-W UNDER DRY AND LUBRICATING CONDITIONS**

**N. Tsyntaru** *Institute of Applied Physics, Moldova, Vilnius University, Lithuania*

#### **TRIBOLOGICAL PROPERTIES OF (EN AW-ALCu4MgSi(A)) ALUMINIUM ALLOY SURFACE LAYER AFTER BALL BURNISHING**

**W. Brostow**, *University of North Texas, USA*, S. Cygan, K. Czechowski, J. Kalisz, J. Laszkiewicz-Lukasik, A. Łętocha, *Institute of Advanced Manufacturing Technology (IAMT), Poland*

#### **WEAR RESISTANCE OF ELECTROSPARK HARD ALLOYS COATINGS IN DIFFERENT ABRASION TEST CONDITIONS**

**A. Žunda**, E. Šalašavičius, A. Romanov, R. Vereckis, *Aleksandras Stulginskis University, Lithuania*

## Section 2

### Tribological materials

14:30 – 16:30

Room 211

Chairmen: **C.G. Figueiredo-Pina**, Co-chairman **H. Cesiulis**

#### **COMPARISON OF DUCTILE DAMAGE MODELS DURING SCRATCH TESTS – A NUMERICAL STUDY**

**A. Mostaani**, M.P. Pereira, B.F. Rolfe, *Deakin University, Australia*

#### **SCRATCH RESISTANCE OF HARD CERAMICS**

**W. Brostow**, N. Hnatchuk, *University of North Texas, USA*, P. Wyzga, *Institute of Advanced Manufacturing Technology (IAMT), Poland*

#### **TRIBOLOGICAL BEHAVIOR PREDICTION FOR AN EPOXY ARAMID SYSTEM BASED ON MECHANICAL AND THERMAL PROPERTIES ANALYSES**

**I. G. Birsan**, I. Roman, S. Ciortan, *Dunarea de Jos University, Romania*

#### **MECHANICAL AND TRIBOLOGICAL PROPERTIES OF SELF-LUBRICATING NANOCOMPOSITES BASED ON POM**

J. Padgurskas, **G. Reškevičius**, *Aleksandras Stulginskis University, Lithuania*, J. Zicans, R. Merijs Meri, I. Bochkov, *Riga Technical University, Latvia*

#### **STUDY OF THE IMPACT OF THE BLEACHING WITH 6% H<sub>2</sub>O<sub>2</sub> SOLUTION ON TEETH WEAR**

F. Rodrigues, *Instituto Superior Técnico, ULisboa, Portugal*, A.P. Serro, *Instituto Superior Técnico, ULisboa, Instituto Superior de Ciências da Saúde Egas Moniz, Portugal*, **C.G. Figueiredo-Pina**, *Instituto Politécnico de Setúbal, Setúbal, Instituto Superior Técnico, ULisboa, Portugal*

#### **TRIBOLOGICAL AND CORROSION PROPERTIES OF IRON-BASED ALLOYS**

**E. Vernickaite**, *Vilnius University, Lithuania*, Z. Antar, *University of Sfax, Tunisia*, A. Nicolenco, *Institute of Applied Physics, Moldova, Vilnius University, Lithuania*, R. Kreivaitis, *Aleksandras Stulginskis University, Lithuania*, N. Tsyntaru, *Institute of Applied Physics, Moldova, Vilnius University, Lithuania*, H. Cesiulis, *Vilnius University, Lithuania*

## Section 3

### Friction and wear in tribosystems

17:00 – 18:40

Conference Hall (Room 214)

Chairmen: **V. Kovan** Co-chairman **N. Tsyntsaru**

#### **SURFACE INTEGRITY ACHIEVED BY FINISHING PROCESSES ON SVERKER 21 AND VANADIS 6 COLD WORKING TOOL STEELS**

W. Brostow, *University of North Texas, USA*, K. Czechowski, *Institute of Advanced Manufacturing Technology (IAMT), Poland*, M. Kot, *AGH University of Science and Technology, Poland*, P. Rusek, **D. Toboła**, *Institute of Advanced Manufacturing Technology (IAMT), Poland*

#### **SURFACE ENGINEERING OF SLIDER VALVES OF FLUID POWER MOTORS MADE OF TOOL STEELS BY USING BORIDING SATURATION MIXTURE**

V.M. Konstantinov, V.G. Dashkevich, **A.V. Kovalchuk**, *Belorussian national technical university, Belarus*

#### **EFFECT OF SURFACE ROUGHNESS ON THE STRENGTH OF 3D PRINTED BUTT JOINTS**

**V.Kovan**, *Akdeniz University, Turkey*, G.Altan, *Pamukkale University, Turkey*, E.S.Topal, H.E.Camurlu, *Akdeniz University, Turkey*

#### **TRIBOLOGICAL PROPERTIES OF DUPLEX LAYERS PRODUCED BY VACUUM CHROMIZING PROCESS**

**B. Bogdanski**, *Institute of Precision Mechanics, Poland*, E. Kasprzycka, *Plock University of Technology, Poland*

#### **THE TRIBODIAGNOSTICS OF THE TECHNICAL CONDITION OF THE HELICOPTER MAIN REDUCTION GEAR**

**L. A. Shabalinskaia**, V. V. Golovanov, E. S. Bubnova, L. V. Milinis., *Central Institute of Aviation Motors named after P.I. Baranov, Russia*

#### **WEAR MODEL DEVELOPMENT OF SOIL TILLAGE ELEMENT**

**R. Skirkus**, V. Jankauskas, Aleksandras Stulginskis University, Lithuania

## Section 4

### Lubricants and lubrication

17:00 – 18:40

Room 214

Chairmen: **A.Ya. Grigoriev** Co-chairman **G. Reškevičius**

#### **OPTICAL INTERFEROMETRY MEASUREMENT OF BSA ADSORPTION IN HYDRODYNAMIC LUBRICATION**

Li X., Guo F., *Qingdao Technological University, China*, **Wong P.L.**, *City University of Hong Kong, China*

#### **MINIATURIZATION OF LUBRICANT DEGRADATION TESTING FOR NATURAL GAS ENGINES**

**D. Bražinskienė**, A. Ručinskienė, S. Asadauskas, *Center for Physical Sciences & Technology, Lithuania*

#### **EVALUATION OF IRON MESOPARTICLES CORROSION IN OILS**

J. Ivanova, T. Melenkova, **H. Cesiulis**, *Vilnius University, Lithuania*

#### **EVALUATION OF CORROSIVENESS OF ALKOXYMETHYLIMIDAZOLIUM IONIC LIQUIDS**

**T.J. Kaldonski**, C. Pakowski, *Military University of Technology, Poland*

#### **BIOLOGICAL GREASES MATERIALS AND THEIR TRIBOLOGICAL EVALUATION (REVIEW)**

**J. E. Izuwah**, *Aleksandras Stulginskis University, Lithuania*

## POSTER PRESENTATIONS

### **P-1. INCREASING WEAR RESISTANCE OF THE 30X13 STAINLESS STEEL BY ELECTROSPARK ALOYING**

V. Agafii, V. Mihailov, A. Ianachevici, Institute of Applied Physics, Moldova J. Padgurskas, A. Andriušis, R. Kreivaitis, *Aleksandras Stulginskis University, Lithuania*

### **P-2. NANOPARTICLE GENERATION METHODS FOR THE PRODUCTION OF LUBRICANTS**

V. Bėčytė, Č. Sipavičius, *Center for Physical Sciences & Technology, Lithuania*, J. Padgurskas, *Aleksandras Stulginskis University, Lithuania*

### **P-3. TRIBOTECHNICAL PROPERTIES OF EDIBLE VEGETABLE OILS**

A.Ya. Grigoriev, I.N. Kavaliyova, V.A. Belyi *Metal-Polymer Research Institute, Belarus*, J. Padgurskas, R. Kreivaitis, *Aleksandras Stulginskis University, Lithuania*

### **P-4. RESEARCH OF THE INFLUENCE FINELY DISPERSED FRICTION MODIFIERS ON THE ANTI-WEAR PROPERTIES OF GREASE LUBRICANTS**

V. Medvedeva, M. Skotnikova, N. Krylov, A. Breki, *Peter the Great St. Petersburg Polytechnic University, Russia*

### **P-5. TRIBOLOGICAL PROPERTIES OF DUPLEX LAYERS PRODUCED BY VACUUM TITANIZING PROCESS COMBINED WITH THE ELECTROLYTIC DEPOSITION OF COBALT ALLOY**

E. Kasprzycka, *Warsaw University of Technology, Poland*, B. Bogdanski, *Institute of Precision Mechanics, Poland*

### **P-6. INVESTIGATION OF THE TRIBOLOGICAL PROPERTIES OF POLYTETRAFLUORETHYLENE MODIFIED WITH METALLIC AND NONMETALLIC NANO PARTICLES**

E. Kutelia, *Georgian University of Technology, Georgia*, D. Gventsadze, *R. Dvali Institute of Machine Mechanics, Georgia*, J. Padgurskas, *Aleksandras Stulginskis University, Lithuania*, L. Gventsadze, O. Tsurtsunia, *Georgian University of Technology, Georgia*

### **P-7. TRIBOLOGICAL PROPERTIES OF SPUTTER DEPOSITED CARBON-COPPER COMPOSITE FILMS**

A. Leitans, N. Bulaha, J. Lungevics, *Riga Technical University, Latvia*

### **P-8. PARTICULARITIES OF THE PSEUDO-PLASTIC LUBRICATION, WITH APPLICATION TO THE SINOVIAL LIQUID**

I. Radulescu, A. V. Radulescu, *University "POLITEHNICA" Bucharest, Romania*, J. Javorova, *University of Chemical Technology and Metallurgy, Bulgaria*

### **P-9. ESTIMATION OF ROLLING-CONTACT BEARINGS OPERATIONAL PROPERTIES BY ELECTRICAL PROBE METHOD**

O. Rekhliitsky, *JSC "STCCE", Belarus*, S. Korotkevich, *RUP Gomelenergo, Belarus*, N. Solovei, D. Rekhliitskaya, *JSC "STCCE", Belarus*

### **P-10. BASE OILS BASES SYNTHESIZED USING TECHNOLOGIES OF RECYCLING WASTE PRODUCTS OF THERMOPLASTICS**

I. Mandzyuk, E. Prisyazhnaya *Khmelnytskyi National University, Ukraine*

### **P-11. RESEARCH OF AIR FLOW DEBIT WITH NEW CONSTRUCTIO INNER LINER**

D. Mažeika, A. Bubulis, *Kaunas University of Technology, Lithuania*, A. Bartkus, *JSC MATURE, Lithuania*, A. Pauliukas, *Aleksandras Stulginskis University, Lithuania*

### **P-12. ELABORATION AND USING OF COMPOSITES BASED ON PHENYLONE AS FRICTION-TYPE BEARINGS OF PLATE CHAINS**

A.I. Burya, Ye.A. Yeriomina, O.A. Naberezhnaya, R.L. Lenchenko, *Dneprodzerzhinsk State Technical University, Ukraine*

**P-13. ENZYMATIC SYNTHESIS OF  $\alpha$ -PROPYLENE GLYCOL WITH (9Z)-OCTADECENOIC ACID BY LIPOLYTIC ENZYME**

M. Gumbytė, R. Kreivaitis, *Aleksandras Stulginskis University, Lithuania*, T. Baležentis, *Lithuanian Institute of Agrarian Economics, Lithuania*

**P-14. TRIBOCORROSION IN DENTAL IMPLANTS: AN IN-VITRO STUDY**

C.G.Figueiredo-Pina, *Instituto Politécnico de Setúbal, Instituto Superior Técnico, ULisboa, Portugal*, V.Moreira, R.Colaço, *Instituto Superior Técnico, ULisboa, Portugal*, A.P.Serro, *Instituto Superior Técnico, ULisboa, Instituto Superior de Ciências da Saúde Egas Moniz, Portugal*

**P-15. STUDY OF THE FRICTION COEFFICIENT BETWEEN ARTIFICIAL SKIN AND ORTHOPEDIC FOAMS**

D.A.Silva, *Instituto Superior Técnico, ULisboa, Portugal*, A.P.Serro, *Instituto Superior Técnico, ULisboa, Centro de investigação Interdisciplinar Egas Moniz, Portugal*, C.G.Figueiredo-Pina, *Instituto Politécnico de Setúbal, Instituto Superior Técnico, ULisboa, Portugal*

**P-16. TRIBOLOGICAL BEHAVIOUR OF *IN SITU* NANOSTRUCTURED POLYMERS**

I. Bosoancu, R. Bosoancu, G. Mihiu, M. Bodor, C. Muntenita, I. Mihalache, I. Graur, C. Ungureanu, A. CIRCUMARU, V. Bria, *Dunarea de Jos University, Romania*

**P-17. TRIBOLOGICAL BEHAVIOUR OF STRATIFIED COMPOSITES**

M. Bunea, I. Bosoancu, R. Bosoancu, G. Mihiu, M. Bodor, C. Muntenita, I. Graur, C. Ungureanu, A. CIRCUMARU, V. Bria, *Dunarea de Jos University, Romania*

**P-18. EVALUATION OF TRIBOLOGICAL PROPERTIES OF MOTOR OILS MODIFIED WITH COMMERCIAL ADDITIVES**

R. Daraganas, J. Padgurskas, R. Kreivaitis, R. Rukuiza, A. Kupčinskas, *Aleksandras Stulginskis University, Lithuania*



## LANGUAGE

The conference language is English.

## INFORMATION FOR SPEAKERS

### Duration of oral reports:

- Plenary sessions – 40 min. (including 5-10 minutes discussion)
- Scientific sessions – 20 min. (including discussion)

Sections' rooms will be equipped for **Multimedia presentations**.

Area of poster presentation should not exceed **A0 format**.

## ARRIVAL

There are three means of most popular regular public transport in Lithuanian cities - buses, trolleybuses and minibuses. It is possible to buy the ticket at a driver. Bus No 18 (price 0,70 EUR) and minibus No 56 (price 0,90 EUR) arrives from city centre to conference venue at Aleksandras Stulginskis University. After arrival to Kaunas airport transferring to Kaunas railway and bus stations is possible by bus No 29.

Taxi costs (daytime):

Kaunas airport - Kaunas downtown – ca 8-12 EUR

Kaunas airport - Aleksandras Stulginskis University campus – ca 13-17 EUR

Kaunas downtown - Aleksandras Stulginskis University campus – ca 7-9 EUR

Timetables of public transport in Kaunas are available at

<http://www.trafi.lt/#!tvarkarasciai/kaunas>

After arrival to Vilnius airport to Vilnius railway and bus stations (same place) is possible by buses No 1 and 3. Timetables of public transport in Vilnius are available at

<http://www.trafi.lt/#!tvarkarasciai/vilnius>

Timetable of trains from Vilnius to Kaunas at <http://www.litrail.lt>

Timetable of buses from Vilnius to Kaunas (buses every 20-30 min.) at:

<http://www.autobusubilietai.lt/>

More information about transfers in Lithuania to and from Aleksandras Stulginskis University is available at: <http://int.asu.lt/arrivtoLT.pdf>

University's campus map at:

<http://int.asu.lt/tsenwhere.pdf>

Touristic information of Kaunas:

<http://www.kaunastic.lt/?lang=en>

Touristic information of Lithuania:

<http://www.lithuania.travel>

## ACCOMMODATION

Participants can arrange their accommodation in University guestrooms (15-20 EUR/day):

<http://intern.asu.lt/university-guestrooms/>

or in the hotels of Kaunas city:

<http://www.kaunastic.lt/index.php/en/turizmas/apgyvendinimas.html>

There are some popular hotels in Kaunas downtown:

- „Kaunas Hotel“ (<http://www.kaunashotel.lt/>)
- „Park Inn by Radisson Kaunas Hotel“ (<http://www.parkinn.com/hotel-kaunas>)
- „Europa Royale Hotel Kaunas“ ([http://www.groupeuropa.com/europa\\_royale/kaunas\\_hotel/](http://www.groupeuropa.com/europa_royale/kaunas_hotel/))
- „Best Western Santakos hotel“ (<http://santakahotel.eu/EN/Kaunas>)

## CULTURAL PROGRAM

### **27 November 2015**

Possibility to participate on cultural performance on Friday evening:

18:00 – 21:00 – XX International contemporary music festival „Iš arti“ (“Close by”)

AMBER SOUND SYMPHONY ORCHESTRA OF LIEPOJA (Latvia), Chief conductor Atvars Lakstīgala (Latvia)

Venue: Kaunas State Philharmonic, L.Sapiegos str. 5, Kaunas

Ticket costs 7 EUR.

### **28 November 2015**

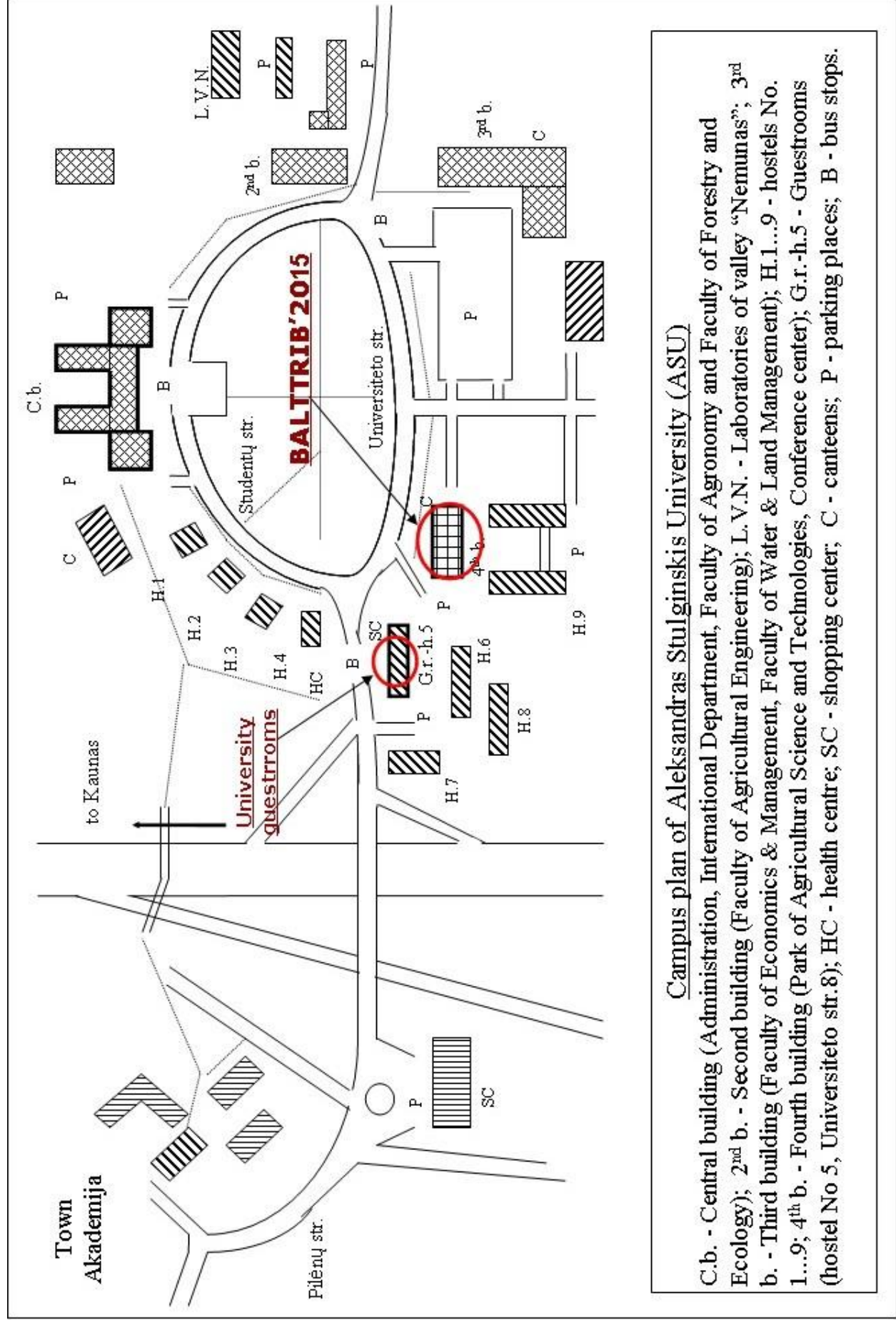
Cultural program in Northern Lithuania will include:

- Travel to Overlook tower at the karstic lakes (karstic sinkholes) in Biržai Regional Park (<http://www.birzuparkas.lt/en/informacija-lankytojams/virtualus-gidas/>);
- Visit at Birzai Castle (<http://www.birzumuziejus.lt/en>): excursion in the castle museum, educational program (Žaldokas Beer);
- Lunch in Restaurant “Pilies skliautai” (Castle Vaults) (<http://piliesskliautai.lt/>).

Departure – at 07:30 from University guestrooms, return – at 19:00

Participation at cultural programme on Saturday costs 50 EUR.

Cultural programme is not included in conference fee and should be paid separately at the registration.



Campus plan of Aleksandras Stulginskis University (ASU)

C.b. - Central building (Administration, International Department, Faculty of Agronomy and Faculty of Forestry and Ecology); 2<sup>nd</sup> b. - Second building (Faculty of Agricultural Engineering); L.V.N. - Laboratories of valley "Nemunas"; 3<sup>rd</sup> b. - Third building (Faculty of Economics & Management, Faculty of Water & Land Management); H.1...9 - hostels No. 1...9; 4<sup>th</sup> b. - Fourth building (Park of Agricultural Science and Technologies, Conference center); G.r.-h.5 - Guestrooms (hostel No 5, Universiteto str.8); HC - health centre; SC - shopping center; C - canteens; P - parking places; B - bus stops.

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