

# **19th International Multidisciplinary Scientific GeoConference (SGEM 2019)**

Nano, Bio and Green - Technologies for a  
Sustainable Future

SGEM International Multidisciplinary Scientific GeoConference  
Volume 19, Issue 6.2

Albena, Bulgaria  
28 June – 6 July 2019

ISBN: 978-1-5108-9001-5

**Printed from e-media with permission by:**

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571



**Some format issues inherent in the e-media version may also appear in this print version.**

Copyright© (2019) by International Multidisciplinary Scientific GeoConferences (SGEM)  
All rights reserved.

Printed by Curran Associates, Inc. (2019)

For permission requests, please contact International Multidisciplinary Scientific GeoConferences (SGEM)  
at the address below.

International Multidisciplinary Scientific GeoConferences (SGEM)  
51 Alexander Malinov Blvd.  
fl 4, Office B5 1712  
Sofia, Bulgaria

Phone: +359 2 405 18 41

Fax: +359 2 405 18 65

[sgem@sgem.org](mailto:sgem@sgem.org)

**Additional copies of this publication are available from:**

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571 USA  
Phone: 845-758-0400  
Fax: 845-758-2633  
Email: [curran@proceedings.com](mailto:curran@proceedings.com)  
Web: [www.proceedings.com](http://www.proceedings.com)

## CONFERENCE PROCEEDINGS CONTENTS

### GREEN BUILDINGS TECHNOLOGIES AND MATERIALS

---

- 1. ANALITICAL AND NUMERICAL STUDY OF IMPACT LOADED CYLINDRICAL SAMPLE**, Prof. Levan Japaridze, Prof. Nikoloz Chikhradze, Prof. Fernand Marquis, Georgia.....3
- 2. ANALYSIS AND MONITORING OF THE CRITICAL CONTROL POINTS IDENTIFIED BASED ON THE RISKS GENERATED BY THE CONCEALED WORKS IN CONSTRUCTION TECHNOLOGIES**, PhD.c. Eng. Bianca Pironea, Romania..... 11
- 3. APPLICATION OF PET BOTTLES FOR CONCRETE MASONRY BLOCKS**, MSc. Jiří Šál, MSc. Petra Nováková, Czech Republic..... 19
- 4. ASSESSMENT OF NON-VENTILATED AIR GAP IN SLOPING ROOF WITH THERMAL INSULATION ABOVE WOODEN RAFTERS**, Ing. Marek Jašek, Ph.D., Ing. Kateřina Kubenková, Ph.D., Ing. Kateřina Stejskalová, Czech Republic.....25
- 5. ASSESSMENT OF PLINTH OF ENERGY-EFFICIENT HOUSE OBJECTS**, Ing. Marek Jašek, Ph.D., Ing. Kateřina Kubenková, Ph.D., Ing. Lucie Mynarzová, Ph.D., Ing. Nikola Vavřínová, Czech Republic..... 35
- 6. COLOR CHARACTERISTICS OF WOOD-MINERAL COMPOSITIONS FOR THE FORMATION OF AN URBAN COLOR ENVIRONMENT**, Elena Gontar, Victor Danilov, Assoc. Prof. Maria Frolova, Russia.....43
- 7. DETERMINATION OF FIBER-CEMENT PANELS DEGRADATION BY A SOAKING-DRYING TEST**, Ing. Michaela Kostecká, Ph.D., Ing. Alena Struhárová, Ph.D, Czech Republic.....51
- 8. DEVELOPMENT OF ENVIRONMENTAL FRIENDLY INSULATION MATERIALS BASED ON SECONDARY TEXTILE FIBERS**, Ing. Petra Zachová, Assoc. Prof. Jiří Zach1, Ing. Vítězslav Novák, Ing. Jan Bubeník, Czech Republic.....57
- 9. DEVELOPMENT OF MANUAL MEASURING TOOLS CLASSIFICATION FOR WOODWORK**, Mg.sc.ing. Ilze Gutmane, Dr.habil.sc.ing. Silvija Kukle, Dr.sc.ing. Rihards Vidzickis, Mg.sc.ing. Inga Zotova, Latvia .....65
- 10. DEVELOPMENT OF WET-PRESERVED HEMP FIBREBOARD WITH THERMAL AND SOUND INSULATION PROPERTIES**, Dr.sc.ing. Edgars Kirilovs, Dr.habil.sc.ing. Silvija Kukle, Dr. rer. agr. Hans-Jörg Gusovius, Mg.sc.ing. Inga Zotova, Dr. agr. Veneranda Stramkale, Latvia .....73
- 11. DIGITAL BUSINESS ECOSYSTEM AS ENABLER OF ECO-INNOVATION: CASE OF CONSTRUCTION SECTOR**, Prof. Dr.oec. Tatjana Volkova, Dr. Arch. Edgars Bondars, Prof. Dr.oec. Veronika Bikse, Prof. Dr.oec. Baiba Rivza, Latvia.....81

<b>12. DIRECTORY LINES REGARDING THE DESIGN AND PRODUCTION OF SELF-CLEANING CEMENTITIOUS COMPOSITES</b> , Eng. Elvira GREBENIŞAN, PhD. Eng. Henriette SZILAGYI, PhD. Eng. Andreea HEGYI, Prof. PhD. Eng. Călin MIRCEA, PhD. Eng. Cornelia BAERĂ, Romania .....	89
<b>13. EFFECT OF INCORPORATED SUPERABSORBENT POLYMERS ON WORKABILITY AND HYDRATION PROCESS IN CEMENT-BASED MATERIALS</b> , Assis. Prof. Dr. Jan Kočí, Assis. Prof. Dr. Jan Fořt, Martin Mildner, Professor Dr. Robert Černý, Czech Republic.....	99
<b>14. ELECTRICAL PROPERTIES OF ENVIRONMENTAL- FRIENDLY SELF-HEATING COMPOSITE MATERIALS</b> , Dr. Lukáš Fiala, Michaela Petříková, Prof. Dr. Robert Černý, Czech Republic.....	107
<b>15. ENVIRONMENTAL ASPECTS OF DISMANTLING OF OLD BUILDINGS DURING THE RECONSTRUCTION IN MOSCOW</b> , Doctor of Philosophy, Associate Professor Larsen O.A., Doctor of Philosophy, Professor Samchenko S.V., Postgraduate Student Naruts V.V., Doctor of Philosophy, Associate Professor Aleksandrova O.V., Doctor of Philosophy, Associate Professor Bulgakov B.I., Russia .....	115
<b>16. THE EXOTHERMIC FLAMELESS HEATERS OF CANNED MEAT PRODUCTS</b> , Prof. A.D. Serikbayeva Assoc. Prof. E.E. Dilmukhambetov Assoc. Prof. K.A.Myrzabek Student N.R. Amangeldi Student A.B. Kuserbayeva, Kazakhstan.....	123
<b>17. EXPERIMENTAL VERIFICATION OF AXIAL BEARING CAPACITY OF BOLTED JOINT IN DEPENDENCE ON HUMIDITY</b> , Kateřina Stejskalová, Ondřej Nečas, Czech Republic .....	131
<b>18. FATIGUE PROPERTIES MODIFICATION ON HEATING OF SHAPE MEMORY NI-TI ALLOYS</b> , Assoc. Prof. Dr. Marius Vasilescu, Assoc. Prof. Dr. Mircea Dobrescu, Romania .....	139
<b>19. FINISHING AND PROTECTIVE THREE-LAYERED SYSTEMS WITH THERMAL INSULATION CHARACTERISTICS</b> , Dr. Irina Popa, Dr. Cristian Petcu, Chem. Alexandrina Mureşanu, Romania .....	147
<b>20. HYGROTHERMAL PERFORMANCE OF WALL SEGMENT UNDER CONDITIONS ALLOWING ICE FORMING PROCESSES</b> , Assoc. Prof. Dr. Jiri Madera, Dr. Milos Jerman, Prof. Dr. Zbysek Pavlik, Dr. Vaclav Koci, Czech Republic.....	155
<b>21. IMPACT ON ENERGY PERFORMANCE USING PHASE CHANGE MATERIALS TO REDUCE ENERGY CONSUMPTION IN BUILDINGS</b> , Prof.Dr.Eng. Gheorghe Badea, Phd. Student Eng. Alexandru-Mihai Gagea, Phd. Student Eng. Veronica Gagea-Manitiu, Phd Student Eng. Alexandru Badita, Phd. Student Eng. Marius Dumitrescu, Romania.....	163

<b>22. INFLUENCE OF BIOMASS ASH ADMIXTURE ON THE PROPERTIES OF MAGNESIUM POTASSIUM PHOSPHATE CEMENT PASTE</b> , prof. Ing. Zbyšek Pavlík, Ph.D., Ing. Martina Zaleska, prof. Ing. Milena Pavlikova, Ph.D., Ing. Jaroslav Pokorny, Ph.D, Czech Republic .....	171
<b>23. INFLUENCE OF MOULD-RELEASING AGENT ON SURFACE PROPERTIES OF COLOURED CONCRETE</b> , Ing. Radka Pernicova Ph.D. , Ing. Monika Utesena, Czech Republic .....	177
<b>24. INFLUENCE OF PHASE CHANGE MATERIALS ON THERMAL STABILITY IN ATTIC ROOMS</b> , MSc. Katerina Stejskalova, Assoc. Prof. Milan Ostry, Czech Republic .....	183
<b>25. LIME PLASTER MODIFIED BY AN UNSUAL POZZOLANA ADMIXTURE – COMPLEX ASSESSMENT OF FUNCTIONAL PROPERTIES</b> , prof. Ing. Zbyšek Pavlík, Ph.D., Ing. Lucie Zemanová, Ing. Michal Lojka, Ing. Ondřej Jankovský, Ph.D., prof. Ing. Milena Pavlíková, Ph.D., Czech Republic .....	191
<b>26. LOCAL STABILITY AND ELASTIC-PLASTIC RESISTANCE OF STEEL MEMBERS</b> , Prof. Ing. Pavol Juhás, DrSc., Prof. Ing. Ingrid Juhásová Šenitková, CSc., Czech Republic.....	199
<b>27. MATHEMATICAL MODELING ON THE ASSESSMENT OF PHOTOVOLTAIC MODULES USED IN BIPV SYSTEMS</b> , Prof.Dr.Eng. Gheorghe Badea, Phd. Student Eng. Veronica Gagea-Manitiu, Phd. Student Eng. Alexandru-Mihai Gagea, Phd Student Eng. Alexandru Badita, Phd. Student Eng. Marius Dumitrescu, Romania.....	207
<b>28. MECHANICAL PROPERTIES OF CEMENT CONCRETE EXECUTED WITH THE DUST FROM THE PURIFICATION OF EXHAUSTS FOLLOWING THERMAL TRANSFORMATION OF THE MUNICIPAL WASTES</b> , PhD Eng. Monika Czop, PhD, DSc Beata Lazniewska-Piekarczyk, Eng. Dominika Bistula, Eng. Aleksandra Gorniak, Eng. Szymon Nowak, Poland.....	215
<b>29. MORPHOLOGICAL AND PHYSIOLOGICAL INDICATORS OF LACTIC ACID BACTERIA FOR THE PRODUCTION OF PROBIOTIC PRODUCTS</b> , Assoc.Prof. Laura Mamayeva L.A. Assoc.Prof. Askarbekov E. Assoc.Prof. Myrzabek K.A. Assoc.Prof. Suleimenova Zh.M., Kazakhstan .....	223
<b>30. PREPARATION OF GEOPOLYMERS BASED ON CERAMIC WASTE PRODUCTS</b> , Prof. Ing. Robert Černý, DrSc., Doc. Ing. Eva Vejmelková, Ph.D., Doc. Ing. Martin Keppert, Ph.D., Ing. Lenka Scheinherrová, Ph.D., Ing. Jitka Krejsová, Czech Republic.....	231
<b>31. PROPERTIES OF WHEAT STRAW ASH GEOPOLYMER FOR CONSTRUCTION USE</b> , Ph.D. Jaroslav Pokorny, Prof. Milena Pavlikova, Ph.D. Ondrej Jankovsky, Associate Prof. Grzegorz Lagod, Prof. Zbyšek Pavlík, Czech Republic.....	239

<b>32. RESISTANCE OF CONCRETE MODIFIED WITH STYRENE-ACRYLATE BASED ADMIXTURE TO AGGRESSIVE ENVIRONMENT</b> , Ing. Daniel Dobias, Ph.D., Ing. David Citek, Ing. Petr Pokorny, Ph.D., Doc. Ing. Jiri Kolisko, Ph.D., Czech Republic.....	247
<b>33. REUSE OF MSWI BA IN THE CERAMIC TILES PRODUCTION: AN EXPERIMENTAL INDUSTRIAL ACTIVITY IN LATIUM REGION (CENTRAL ITALY)</b> , Giuseppe Sappa, Silvia Iacurto, Paolo Viotti, Fabio Tatti, Italy .....	255
<b>34. STUDY OF THERMAL INSULATING PROPERTIES OF INSULATORS BASED ON BY-PRODUCTS UNDER VACUUM</b> , Assoc. Prof. Ing. Jiri Zach, Ph.D., Ing. Petra Zachova, Ing. Vitezslav Novak, Ing. Jitka Peterkova, Ph.D., Czech Republic.....	263
<b>35. TECHNOLOGY OF CONTROLLING A BEAM MADE OF POLYTECH MATERIAL USED IN THE BUILDING PREFABRICATION SYSTEM</b> , mgr inž. arch. Hubert Walusiak, Poland.....	271
<b>36. CONTROL OF THERMAL COMFORT OF ROOMS IN AN OFFICE BUILDING IN OCTOBER 2018</b> , Dr inž. Konrad Sikora, Prof. dr hab. inž. arch. Marcin Furtak, Poland.....	279
<b>37. THE INFLUENCE OF WIND SPEED TO THE TEMPERATURE INSIDE THE WALL IN THE WINTER SEASON.</b> , mgr inz. Patrycja Antonik-Popiolek, dr inz. Malgorzata Fedorczyk-Cisak, dr hab. inz. Arch. Marcin Furtak, Poland.....	287
<b>38. THE MODIFICATION OF A 3D PRINTER FOR LASER ENGRAVING</b> , Ing. Antonin Durna, Ing. Tomas Kubin, Ph.D., Ing. Jan Blata, Ph.D., MgA. Petr Nenicka, Czech Republic.....	295
<b>39. THE USE OF SULPHATE WASTE FOR MODIFYING CEMENT CLINKERS</b> , Prof. Dr.Sc. Yury Krivoborodov, Prof. Dr.Sc. Ekaterina Potapova, Prof. Dr.Sc. Svetlana Samchenko, Prof. Dr.Sc. Tamara Kouznetsova, Russia.....	303
<b>40. TVOC EMISSIONS FROM BUILDING MATERIALS AND VENTILATION RATE – CASE STUDY</b> , Ing. Michal Kraus, Ph.D., prof. Ing. Ingrid Juhásová Šenitková, CSc., Czech Republic .....	309
<b>41. UTILIZATION OF CONCRETE SLURRY WASTE IN GYPSUM BASED COMPOSITES</b> , Dr. Pavel Reiterman, Vendula Davidová, Assoc. Prof. Martin Keppert, Czech Republic.....	317
<b>42. SUSTAINABLE LIGHTING REFURBISHMENT SOLUTIONS: TECHNICAL UNIVERSITY OF CLUJ-NAPOCA</b> , Dr. Calin CIUGUDEANU, Assoc. Prof. Dr. Dorin BEU, Romania.....	325

---

## GREEN DESIGN AND SUSTAINABLE ARCHITECTURE

---

<b>43. ACCURACY OF PARAMETRICALLY DETERMINED PRICE OFFER FOR LOW-ENERGY AND PASSIVE FAMILY HOUSES, Marek Vrbka M.Sc., Assoc. Prof. Alena Ticha, M.Sc., Ph.D., Czech Republic .....</b>	<b>335</b>
<b>44. AN ANALYSIS OF THE CURRENT STATE OF DENDROLOGICAL OBJECTS PROTECTED BY THE CITY OF KHERSON, PhD Tetyana Boiko, PhD Pavel Boiko, PhD Olha Dementieva, Ukraine .....</b>	<b>343</b>
<b>45. ANALYSIS OF THE EFFECTIVENESS OF THE IMPLEMENTED DESIGN ARRANGEMENTS ON THE VEHICLE OPERATING SPEEDS IN THE TEMPO-30 ZONE, Professor Alicja Sołowczuk, PhD Eng, Przemysław Gardas, PhD Eng, Poland.....</b>	<b>349</b>
<b>46. APPLICABILITY OF EXISTING STUDIES FOR PEDESTRIAN MOVEMENT ANALYSIS AND PUBLIC SPACE QUALITY IN SMALL TOWNS, Ing. Zuzana Kramarova, Ph.D., Czech Republic.....</b>	<b>357</b>
<b>47. APPLICATION OF BIOPHILIC DESIGN IN CONTEMPORARY LIBRARY ARCHITECTURE, MSc Eng. Arch. Marcin Gierbienis, Poland .....</b>	<b>365</b>
<b>48. ASSESMENT OF ADDITIONAL SHADING DEVICES INSTALLED ON G40 PREFAB HOUSES IN TERMS OF INDOOR ENVIRONMENT, Ing. arch. Martin Stark, Ing. arch. Anna Marie Cerna, Czech Republic .....</b>	<b>379</b>
<b>49. ASSESSMENT OF THE SUSTAINABILITY OF THE FLAT ROOF SYSTEMS, Ing. Michal Kraus, Ph.D., prof. Ing. Ingrid Juhásová Šenitková, CSc., Czech Republic.....</b>	<b>387</b>
<b>50. BRICK VERSUS WOOD CONSTRUCTION IN RESIDENTIAL BUILDING, Tomas Hrdlicka, Martin Cupal, Czech Republic .....</b>	<b>395</b>
<b>51. CAPACITY ASSESSMENT OF CONTROLLED INTERSECTIONS WITH U-TURN, Associate professor Vladislav Krivda, Dr. Jan Petru, Czech Republic.....</b>	<b>403</b>
<b>52. CFD SIMULATION OF AIR TEMPERATURE STRATIFICATION IN HISTORICAL BUILDING OF THEATRE, Assist. Prof. Martin Kovac, Assist. Prof. Katarina Kovacova, Slovakia .....</b>	<b>411</b>
<b>53. COMPARATIVE CALCULATION OF GLOBAL AND HEATING COSTS FOR NEARLY ZERO ENERGY SINGLE-FAMILY BUILDING, Dr. Staņislavs Gendelis, Mikus Miķelsons, Assoc. Prof. Dr. Andris Jakovičs, Edgars Bredovskis, Latvia.....</b>	<b>417</b>

<b>54. COMPARISON OF ENERGY EFFICIENCY PROPERTIES OF CHOICE TYPES OF INDIVIDUAL HOUSES</b> , Prof. Ing. Dusan Katunsky, CSc., Dipl. Ing. Marek Fararik, Slovakia .....	425
<b>55. DESIGN GUIDELINES FOR CREATING A VITAL WOONERF STREET.</b> , PhD Joanna Dudek, Poland .....	433
<b>56. ECOINDEX AS A TOOL OF REGULATION OF THE URBAN GREENERY IN THE PUBLIC SPACE</b> , Ing. arch. Karol Görner, PhD., Ing. arch. Zuzana Kadášová, Slovakia .....	441
<b>57. EXPERIMENTAL SIMULATION OF DAYLIGHT FACTOR AND ITS PERCEPTION BY ARCHITECTS</b> , Kristyna Schulzova, Lenka Prokopova PhD, Assoc. Prof. Daniela Bosova, Czech Republic.....	449
<b>58. FACADES MADE OF G40 SYSTEM BEFORE AND AFTER THERMAL INSULATION</b> , Ing. arch. Anna Marie Černá, Czech Republic .....	457
<b>59. GREEN CONSTRUCTION AS ESSENTIAL APPROACH IN SUSTAINABLE DESIGN: COMPREHENSIVE REVIEW</b> , Ing. Michal Kraus, Ph.D., Czech Republic.....	465
<b>60. HEMP FIBRES REINFORCED BIO-COMPOSITES FOR SUSTAINABLE DESIGN</b> , Mg. sc.ing. Anete Smoca, Latvia .....	471
<b>61. IMPACT OF TRANSPORT ANALYSIS ON URBANIZATION DEVELOPMENT IN SMALL TOWNS OF SLOVAKIA</b> , Assoc. prof. Tibor Schlosser, Ing. Dominika Hodakova, Dr. Andrea Zuzulova, Ing. Marek Branis, Dr. Peter Schlosser, Slovakia.....	479
<b>62. INVESTIGATION OF INDOOR AIR QUALITY IN THE NURSERY SCHOOL</b> , Prof. Ing. Ingrid Juhásová Šenitková, CSc., Ing. Michal Kraus, Ph.D. Czech Republic.....	487
<b>63. PASSIVE DESIGN STRATEGIES FOR RESIDENTIAL BUILDINGS IN THE HOT DESERT CLIMATE IN UPPER EGYPT</b> , Sara Elhadad, Balint Baranyai, Janos Gyergyák, Istvan Kistelegdi, Ali Salem, Hungary .....	495
<b>64. RAILWAY TRANSPORTATION SYSTEM OF THE KRAKÓW METROPOLITAN AREA – PROBLEMS AND OPPORTUNITIES</b> , Dr inż.arch.Tomasz Bajwoluk, Poland .....	503
<b>65. RESEARCHES REGARDING THE LANDSCAPING OF A DOG PARK IN THE CITY OF TIMISOARA, ROMANIA</b> , Assoc. Prof. Dr. Berar Cristian, Master Student Popa Dan Lucian, Assistant Prof. Dr. Toța Cristina Elena, Assistant Prof. Dr. Silivășan Marius, Romania.....	511



<b>66. SAFETY AND CAPACITY ASSESSMENT OF NON-STANDARD ROUNDABOUTS</b> , Associate professor Vladislav Krivda, Dr. Jan Petru, Czech Republic.....	517
<b>67. SMART GREEN CITY - ALTERNATIVE AND SUSTAINABLE CITY OF THE FUTURE.</b> , Assoc. Prof. Dr. Kliment Naydenov, Bulgaria .....	525
<b>68. SOCIO-ECONOMIC AND POLITICAL PROBLEMS IN BUILDING AND MANAGING ALTERNATIVE AND SUSTAINABLE CITIES OF THE FUTURE</b> , Chief. Assist. Prof. Dr. Metodi Ivanov, Bulgaria.....	533
<b>69. SPACES FOR INTERPRETATION OF HERITAGE IN THE ACHIEVEMENTS OF ROMANIAN ARCHITECT IOANA GRIGORESCU</b> , Associate Professor Habil. PhD. Arch. Ileana Maria Kisilewicz, Romania.....	541
<b>70. STUDY ON THE POSSIBILITY OF BUILDING A VERTICAL GARDEN ON THE BUASVMT FAÇADE</b> , Assoc. Prof. Dr. Berar Cristian, Master Student Sarbu Dorela Mirabela, Assistant Prof. Dr. Tota Cristina Elena, Assistant Prof. Dr. Silivăşan Marius, Lecturer Mălăescu Mihaela, Romania .....	549
<b>71. SUSTAINABLE STRUCTURAL DESIGN METHODOLOGY FOR LATTICE TELECOMMUNICATION TOWERS</b> , Assoc. Prof. Victoria Elena ROŞCA, PhD, Assoc. Prof. Vlad MUNTEANU, PhD, Prof. Dorina Nicolina ISOPESCU, PhD, Romania.....	557
<b>72. THE IMPACT OF EXTENDING THE PRECAST PANEL HOUSE LOGGIA ON THE INDOOR ENVIRONMENT</b> , Kristyna Schulzova, Assoc. Prof. Daniela Bosova, Czech Republic.....	565
<b>73. TIME LIMIT AS A FACTOR INFLUENCING THE STABILITY OF THE OF THE WORKSPACE</b> , PhD. Natalya Zvyagina, assis. Anna Taleeva, assis. Galina Kirillova., Russia .....	573
<b>74. TRAFFIC FLOW CONDITIONS AT PEDESTRIAN REFUGES LOCATED ON REGIONAL ROAD SECTIONS IN VILLAGE AREAS</b> , Professor Alicja Sołowczuk, Dominik Kacprzak, MSc Eng, Poland.....	583
<b>75. VALUATION OF CERTIFIED OFFICE BUILDINGS IN CZECH REPUBLIC</b> , Dr. Milada Komosna, Tereza Jandaskova, Tomas Hrdlicka, Zuzana Mrnova, doc. Alena Ticha, Czech Republic.....	591
<b>76. VISUAL COMFORT ASSESMENT IN THE OFFICE, A CASE STUDY</b> , Ing. Erika Dolnikova, PhD., prof. Ing. Dusan Katunsky, CSc., Slovakia .....	597
<b>77. VISUAL IMPACT OF ADDITIONAL SHADING ELEMENTS ON FAÇADE OF HISTORICAL BUILDING – A CASE STUDY</b> Ing. arch. Martin Stark, Czech Republic.....	605

**78. VISUAL IMPACT OF NEW SUN-SHADING ELEMENTS ON THE FACADE OF G40 PREFAB HOUSE**, Ing. arch. Anna Marie Cerna, Ing. arch Martin Stark, Czech Republic.....613

**79. TINY BUILDING. LEGAL CONSIDERATIONS FOR BUILDING TINY HOUSES IN POLAND**, Ph.D. Eng. Arch. Janusz Barnaś , M.S. Eng. Arch. Krzysztof Barnaś , M.S. Eng. Arch. Olga Kania.....621

## **SPACE TECHNOLOGIES AND PLANETARY SCIENCE**

---

**80. CONSIDERATIONS ABOUT PROCEDURES FOR PROCESSING AND ANALYSIS OF GEOMAGNETIC DATA RECORDED IN OBSERVATORY**, Dr. Natalia-Silvia Asimopolos, PhD Student Adrian Aristide Asimopolos, Dr. Laurentiu Asimopolos, Romania .....631

**81. EFFECTS ON THE ACCURACY AND REPEATABILITY OF DESIGN PARAMETERS FOR TORQUE WRENCH**, Ing. Pavel Novak, Ing. Lukas Rudolf, Ing. Tomas Hapla, Assoc. Prof. Dr. Ing. Ladislav Kovar, Czech Republic .....639

**82. FAST EVALUATION OF MULTIVARIATE MONOMIALS FOR SPEEDING UP NUMERICAL INTEGRATION IN SPACE DYNAMICS**, Prof. L. K. Babadzanjanz, Assoc. Prof. I. Yu. Pototskaya, Assoc. Prof. Yu. Yu. Pupysheva, A. T. Saakyan, Russia .....647

**83. NATURE AND STRUCTURE OF SATURN'S MAGNETIC FIELD**, Arkadiy Nikolaevich Dmitriev, Russia .....655

**84. NOETHER'S SYMMETRY IN HORAVA-LIFSHITZ COSMOLOGY**, PhD student, M.B. Arzimbetova, Cand. Sc. (Phys.-Math.), PhD, Sh.R. Myrzakul, PhD, T.R. Myrzakul, PhD student, M. Imankul, PhD, G. Yar-Mukhamedova, Kazakhstan .....667

**85. QUANTUM APPROACH TO F(R) GRAVITY WITH F-ESSENCE**, PhD student, M. Imankul, PhD, G. Yar-Mukhamedova, Cand. Sc. (Phys.-Math.), PhD, Sh.R. Myrzakul, PhD student, M.B. Arzimbetova, PhD, T.R. Myrzakul, Kazakhstan .....675

**86. RESEARCHES REGARDING THE USE OF DRONES IN AGRICULTURE**, PhD. Student Sebastian Lucian Muraru, Math. Petru Cardei, PhD. Vergil Muraru, SR III Raluca Sfîru, Eng. Paula Condruz, Romania.....683

**87. SOME THEORETICAL ASPECTS OF THE THERMAL STABILIZATION IN CUBESATS AND THEIR COMPONENTS**, Head of Laboratory, Dr.Sci. Marina Barulina, Leading Researcher, Cand. Sci. Alexey Golikov, Russia.....691

**88. SPACECRAFTS CONTROL CAPABILITIES VIA THE SOLAR SAIL IN THE PHOTOGRAVITATIONAL FIELDS**, Assoc. Prof. Vladimir Korolev, Assoc. Prof. Elena Polyakhova, Assoc. Prof. Irina Pototskaya, Russia.....699

**89. THE MULTIFACTORIAL SIMULATION OF ASSESSING THE ACCURACY OF MODERN STAR CATALOGUES**, Andreev Alexey, Nefedyev Yury, Churkin Konstantin, Demina Natalia, Borovskih Viktor, Russia.....707

**90. THE ROBUST METHOD FOR SELENOPHYSICAL PARAMETERS ESTIMATIONS**, Nefedyev Yury, Andreev Alexey, Demina Natalia, Akhmetshina Ekaterina, Borovskih Viktor, Russia .....713