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SOCIETY FOR ETHICS AND EVALUATION OF CULTURE IN SCIENCE

DRUŠTVO ZA ETIČNOST I VREDNOVANJE KULTURE U NAUCI

SCIENTIFIC MEETING WITH INTERNATIONAL PARTICIPATION

NAUČNI SKUP SA MEĐUNARODNIM UČEŠĆEM

# CONTEMPORARY SUPPORT OF TECHNOLOGICAL SCIENCES IN CULTURAL HERITAGE PRESERVATION AND ETHICAL ASPECTS /

# SAVREMENA PODRŠKA TEHNIČKO-TEHNOLOŠKIH NAUKA U OČUVANJU KULTURNE BAŠTINE I ETIČKI ASPEKTI

BOOK OF ABSTRACTS, SELECTED PAPERS AND POSTERS FROM THE CONFERENCE

KNJIGA APSTRAKATA, IZABRANIH RADOVA I POSTERA SA KONFERENCIJE

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**PROGRAM**

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| OPENING | |
| 13:00 h | WELCOME SPEECH<br>Dr Radomir Glavički<br>President of the Control Committee of the Society for Ethics and Evaluation of Culture in Science<br>President of the Technical Committee |
| 13:15 h | INTRODUCTORY SPEECH<br>Prof. Milesa Srećković<br>President of the Scientific Committee |
| INVITED LECTURES | |
| 13:30 h | Stanko Ostojić<br>Faculty of Technology and Metallurgy, University of Belgrade<br>Contemporary Approach of the Physics and Cultural Heritage Preservation |
| 14:00 h | Suzana Polić<br>Central Institute for Conservation, Terazije 26, 11000 Belgrade<br>Philosophy of Technology in Preservation of Cultural Heritage and Ethical Aspects |
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| SECTION 1<br>14:45 – 16:55 | |
| 1.1. | Marija Hribšek<br>Faculty of Electrical Engineering, University of Belgrade, Bulevar Kralja Aleksandra 73, 11000 Belgrade<br>The role of electronics and SAW sensors in preservation of cultural heritage |
| 1.2 | Zoran Karastojković, Radiša Perić, Milesa Srećković, Suzana Polić<br>High Technical School of Professional Studies, Bulevar Zorana Đinđića 152a, 11070 Belgrade<br>„Perić&Perić" d.o.o., Dunavska 114-116, 14000 Požarevac,<br>Faculty of Electrical Engineering, University of Belgrade, Bulevar Kralja Aleksandra 73, 11000 Belgrade,<br>Central Institute for Conservation, Terazije 26, 11000 Belgrade<br>Difusion Welding of Golden Jewelry from Ancient Times up Today |
| 1.3 | Ljubinko Janjušević, Suzana Polić<br>Goša Institute, Belgrade, Serbia<br>Central Institute for Conservation, Belgrade, Serbia |

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| 1.4 | Višeslava Rajković<br>Institute of Science Vinča, Belgrade<br>The importance of microscopic examination for the restoration and conservation of the cultural heritage |
| 1.5 | Biljana Đokić Milošević, Julijana Mirčevski<br>Faculty of Electrical Engineering, University of Belgrade<br>Management of Digitalized Document in Past and Present |
| 1.6 | Biljana Đokić, Jevrem Niković<br>Faculty of Electrical Engineering University of Belgrade,<br>Kontrolmatik doo, Belgrade<br>Electrical Instalation and Automatisation in Reconstruction of Museum's Objects |
| 1.7. | Veljko Zarubica<br>Analysis d.o.o , Belgrade<br>Selected problems in materials diagnostic of interest for cultural heritage |
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| 1.13. | Milesa Srećković, Rajko Šašić, Svetlana Pelemiš, Slobodan Bojanić, Suzana Polić<br>Faculty of Electrical Engineering, Belgrade,<br>Faculty of Technology and Metallurgy, Belgrade, |

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| | Faculty of Technology, Zvornik,<br>Universidad de Madride,<br>CIK, Belgrade<br>Role of Quantum Generators in Systems of Interest for Cultural Heritage in Linear and Nonlinear Regimes |
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| 2.3 | Aleksander Kovačević,<br>Institute of Physics, University of Belgrade<br>The role of informatics and neural nets in cultural heritage preservation |
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| 2.5 | Branka Kaluđerović, Milesa Srećković, Zoran Fidanovski<br>Institute of Nuclear Science Vinča,<br>Faculty of Electrical Engineering, University of Belgrade<br>RAF, University Union, Belgrade<br>Textile materials and interaction with laser beams of interest for cultural heritage |
| 2.6 | Slađana Pantelić and Branka Radojičić,<br>Faculty of Electrical Engineering, Belgrade<br>Systems of Video Control in Function of Cultural Heritage |
| 2.7 | Branka Radojičić and Slađana Pantelić<br>Faculty of Electrical Engineering, Belgrade<br>Alarm sensors in the functions of preservation of cultural heritage |
| 2.8 | Sanja Jevtić<br>CIP, Belgrade |

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| | Lidar methods in cultural heritage preservation |
| 2.9 | Zoran Fidanovski<br>RAF, University Union, Belgrade<br>Experimental methods with laser application in evaluation of materials of cultural heritage and choice of optimal theory for data interpretation |
| 2.10 | Anđelka Milosavljević, Sanja Petronić, Suzana Polić, Milesa Srećković<br>Faculty of Mechanical Engineering, University of Belgrade<br>Innovation Center Faculty of Mechanical Engieering, University of Belgrade<br>Central Institute for Conservation, Belgrade<br>Faculty of Electrical Engineering, University of Belgrade<br>Pressure vessels at the George W. Weifert Museum |
| 2.11 | Milesa Srećković, Željka Tomić, Stanko Ostojić, Suzana Polić, Zoran Fidanovski, Sanja Jevtić, Đurđe Milanović, Dragan Jevtić, Aleksandar Bugarinović<br>Faculty of Electrical Engineering, University of Belgrade; Tehnikum Taurunum High Technical School, Belgrade, IRITEL a.d., Belgrade; Faculty of technology and metallurgy, University of Belgrade; Central Institute for conservation, Belgrade; RAF, University Union, Belgrade; CIP, Belgrade; Megatrend, Belgrade; Serbian railways infrastrucutre a.d., Belgrade; Telekom Srpske, Bijeljina, Republika Srpska, Bosnia and Herzegovina<br>Some tasks of laser techniques of interest for cultural heritage |
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| 2.14 | Nimia Maria Herrera Guillen and Nagely Herrera<br>State University of Panama, Panama<br>On Cultural Heritage in Panama |
| 2.15. | Rade Sekulić and Nikola Slavković<br>Datacom Belgrade,<br>Technical School for Information Technologies<br>Optical Network in Systems for Prospects of Culture Monuments |
| 19:00 | CLOSING CEREMONY<br>Radomir Glavički |
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Keywords: laser techniques, material processing, simulations

## 2.12 Thin Films, Electron Beam Welding and Advantages of Laser Methods

Aleksandar Bugarinović
Telekom Srpske, Bijeljina, Republika Srpska, Bosnia and Herzegovina

Abstract

Electron beam is used as a technique for evaporation of base in the formation of thin films, for etching films, repair, etc. Applications of fast electrons for welding, soldering, drilling and surface treatment processes of materials, has been known in the middle of the last century. Together with techniques of laser beams are one of the most intuitive use of laser and electron beams, with respect to this that the concept of welding is related with high-energy processes, and laser and electron beams are related with high po-wer density. For a description of the interaction with high energy beams are developed analytical and numerical methods. In this paper will be presented some of the experiments done with samples of various sizes, connecting same and different materials, with the use of different energies and speed of passing beam. We looked at the effects of different techniques, in different modes of operation and different conditions, products in the material and make comparisons. We will characterize the compounds, conclusions and comments for conventional treatment processes, as well as for processes that are not included in conventional, but covered by the experiments.

Keywords: laser welding, electron beam

## 2.13 Selected Methods of Collecting and Processing Field Data for Reconstruction of the Single-Nave Church

Dragović Magdalena[1], Srećković Milesa[2], Čučaković Aleksandar[1], Pejić Marko[1], Pandžić Jelena[1]
[1]Faculty Civil Engineering, Univ.Belgrade, [2]Faculty Electrical Engineering, Univ.Belgrade

Abstract

Modern technologies enable high-precision collecting of field data and its processing in order to create documentation, perform various analyses or reconstruction of buildings

that are an important part of cultural heritage. This paper presents procedures and methods implemented on two devastated single-nave churches at the territory of Serbia, which have been categorized as monuments of high national importance.

For the purpose of revitalization of monuments devastated due to their long time exposure to various environmental influences and wars, data acquisition was performed for two religious historical buildings which date back to the period of a great founder, dynasty ruler Stefan Lazarević (14-15$^{th}$ century). Both of these churches represent cultural heritage of Serbia. Data related to the Church of the Presentation of the Virgin in the village of Slavkovica near Ljig was obtained through the photogrammetric method of data acquisition, while the Church of St. George in the village of Nemenikuće on Mount Kosmaj was a subject of terrestrial laser scanning (TLS). Analyses of physical properties of material samples taken in the field were done as well. The resulting 3D models of the current state of the structures in the form of point clouds were used to perform various analyses (geometrical, architectural and construction style characteristics and construction techniques), whereby modern instruments and data processing software as well as graphics software for 3D modeling were employed. Based on the models of the current state of the structures and comprehensive analyses (historical, style, geometrical and proportional) virtual 3D models of the complete structures were created as conceptual proposals for rebuilding the devastated structures. For the church in Slavkovica this material was used for delivering a final architectural-construction design.

For the purpose of creating a 3D model of some cultural monument using modern methods, field data acquisition significantly differs from classical methods of measuring and delivering technical documentation (blueprints, views, sections, etc.). Current and indispensable procedures nowadays are photogrammetry (close-range and aerial) and laser scanning (terrestrial) which give a point cloud as a result. This point cloud is further on processed using appropriate software and serves as a base for creating documentation. The additional quality of the data obtained this way is the possibility of creating virtual 3D models accompanied by animations which can be used for historical, educational, scientific, cultural and informational purposes.

**Keywords**: field data acquisition, photogrammetry, TLS, graphic data processing, material analyses, geometric form analyses, 3D modeling.

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## 2.14 SOME OBJECTS OF CULTURAL HERITAGE IN PANAMA

Nimia Maria Herrera Guillen and Nagely Herrera
State University of Panama, Panama

Abstract

The Republic of Panama is located between 7 ° and 9 ° N and 77 ° and 83 ° W (Fig.1).

Before coming of the Spaniards, 1501, the area was inhabited by Indians with roots in Central America, South America, and the Caribbean Islands and localities, branches of the Maja and Inka. Spaniards have raised the settlement and started extracting silver and gold and exploiting other resources and transporting them from or to several locations. Needed workforce were mostly Indians, then black people from West Africa (Angola, Cameroon, Guinea and Congo). A pair of centuries later arrived Chinese, the Italians, the French and other Europeans, and the Americans at the end of XIX century. Over time it is created a mixture of races and customs, in which each group has kept some of own characteristics, but came to the prevalence of Spanish culture and white people. The mixture created a race mestizos - of whites and Indians, mulatos- of blacks and whites, zambos-of blacks and Indians, etc.

At present 70% of Panamanians are Mestizos (Fig.2), Mulatos and Afropanamenians 14%, Whites 10%, Indians 5% and 1% Asians, mostly Chinese, but at the same all live over the country, also with the allocation of the majority of Indians and Afropanamenians in some areas where they had settled over the centuries. Indians in their majority live in five Counties, with about seven different groups, and Afropanamenians in several sectors by the Caribbean Sea.

The core of the Indian population (Fig. 3) live quietly in their lands from times of the Spaniards arriving, cultivating their language and manners of life, dedicated to wooden sculptures, processing ornaments of multicolored beads or textile((Fig.4-6) or painting own body(Fig.7) and storytelling, but only two larger groups have the writing. They preserve dances, beliefs, clothing, moral code, political and social organization.

Afropanamenians as a form of resistance and opposition to Spaniard colonizers had talked mixing Spanish, English, French and Portuguese.

The remaining inhabitants are mainly nurture the languages and traditions of its origin and all recognize Spanish as the official language in Panama. Unlike the Europeans who

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