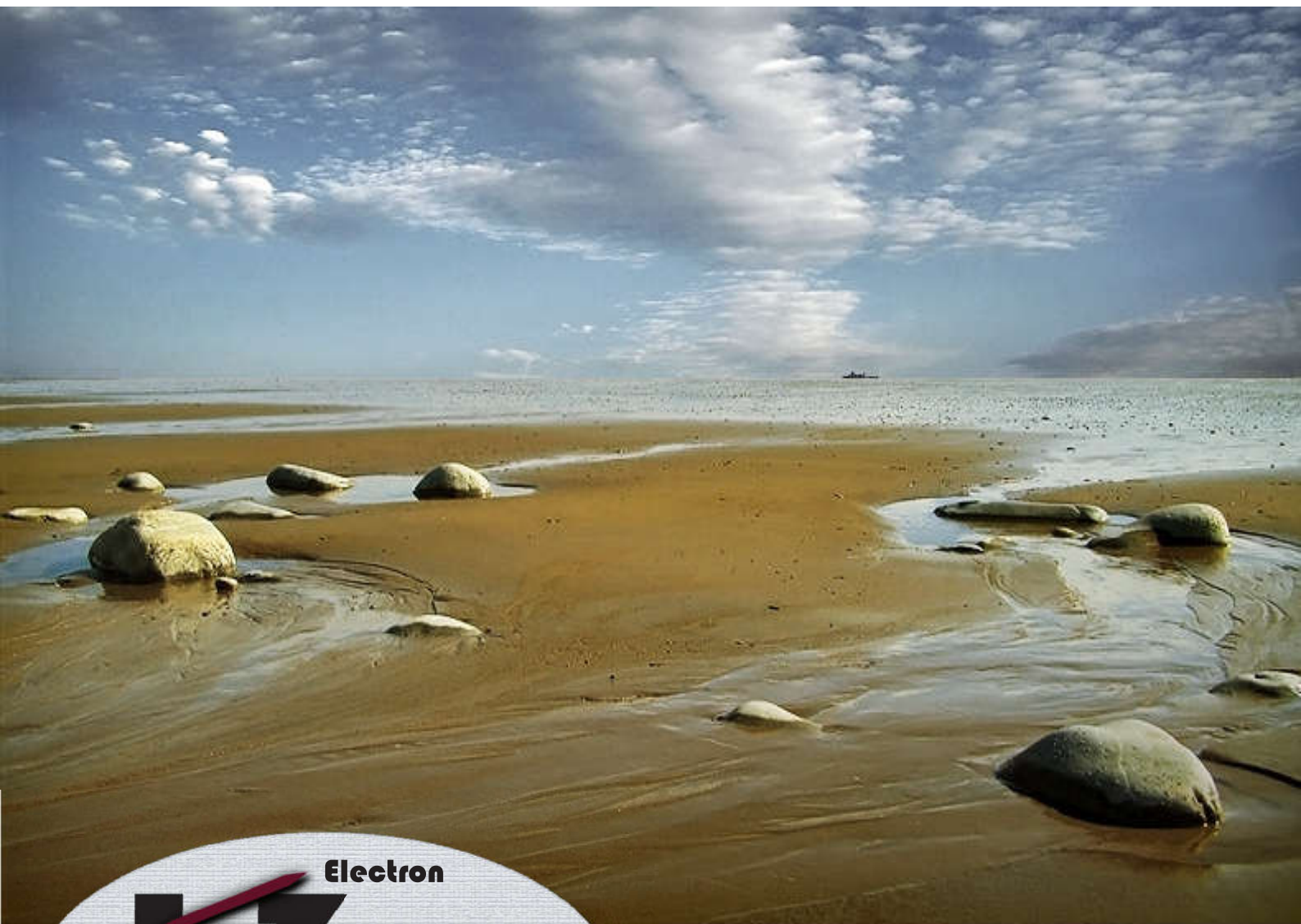
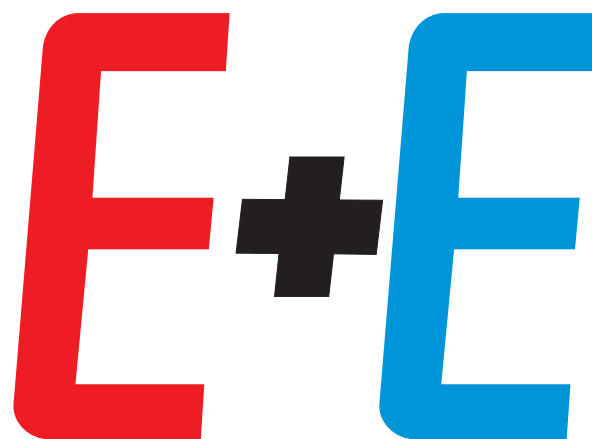


7•8•2018

ЕЛЕКТРОТЕХНИКА  
И ЕЛЕКТРОНИКА

ELECTROTECHNICA  
& ELECTRONICA



 Electron  
Beam  
Technologies  
**EBT 2018**  
INTERNATIONAL CONFERENCE  
VARNA, BULGARIA

# Electron Beam Technologies

18-22 June 2018, Varna, Bulgaria  
**Thirteenth International Conference**

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*SPECIAL ISSUE*  
**The Thirteenth International Conference on  
Electron Beam Technologies (EBT 2018)**  
18-22 June 2018, Varna, Bulgaria

**Preface**



This issue contains a part of the papers, presented at the 13-th International conference on Electron Beam Technologies (EBT 2018) that were accepted for publication in this issue of the scientific and technical journal „Electrotechnica & Electronica E+E” after reviewing.

EBT 2018 was held in hotels Estreya Palace and Estreya Residence, Resort "St. Constantine and Elena" in Varna, Bulgaria from 18 to 22 June 2018. This biannual meeting brings together physicists, chemists, material, mechanical and electronics engineers from universities, research institutions and industry, who are involved in various studies and applications of electron beam technologies and techniques. The conference has provided an excellent forum for exchange of expertise and forging human links. The conference gives the opportunity to find research project partners and to make business contacts.

The EBT 2018 is one of the series conferences on Electron Beam Technologies that started in 1985 in Varna. During these 33 years from the first EBT conference, the twelve previous successful meetings held, clearly demonstrate the dynamic development of the equipment and technologies utilizing accelerated electrons and ions. That long period is traced by the achievements of two-three generations of researchers. Remarkable research results in topics as beam physics, generation of beams and plasma flows, electron beam evaporation and deposition of functional coatings, electron accelerators applications are obtained. Accelerated electrons modify the

metal surfaces, improving hardening, providing better wear and corrosion protection. Accelerated electrons are used for synthesis, decomposition and polymerization as well as modification of biomaterials. Ion bombardment is matured technology for implantation of dopants in the semiconductor industry and now starts to be used for sterilization of medical instruments. Ion sputtering is widely utilized in thin film deposition. Many others technologies, based on the use of electrons, ions, plasma and lasers were developed and their big industrial implementation potential was demonstrated.

Electron beam and the mentioned complementary charged particles beam applications are novel promising technologies for many industries for manufacturing of products that need surface or building material structure modification. The rapid development of the energy beam techniques for material modification and analysis is one of the most spectacular examples of the strong feedback between industry and basic research. However, extensive research work is necessary in the near future to explore various aspects of these newer fabrication processes.

The contents of this issue of journal „Electrotechnica & Electronica E+E” show a great scope of activities of participants of EBT 2018. As Editors of this issue we hope that conference papers, published here, will provide the subscribers of „Electrotechnica & Electronica E+E” or the readers of university libraries new portion of actual information, concerning the science and applications of intense electron beams. We hope that the

published papers will bring some ideas about new directions in their research and development fields.

On behalf of the International Organizing Committee of the EBT 2018 and of behalf of the Editorial Board of the journal "Electrotechnica & Electronica" we express our thanks to all the participants and their Institutions for the contribution to the

realization of the conference and the cooperation to prepare this issue.

**Prof. Georgi Mladenov,**  
**Assoc. Prof. Elena Koleva**  
Co-chairmen of EBT 2018  
Editors of this issue