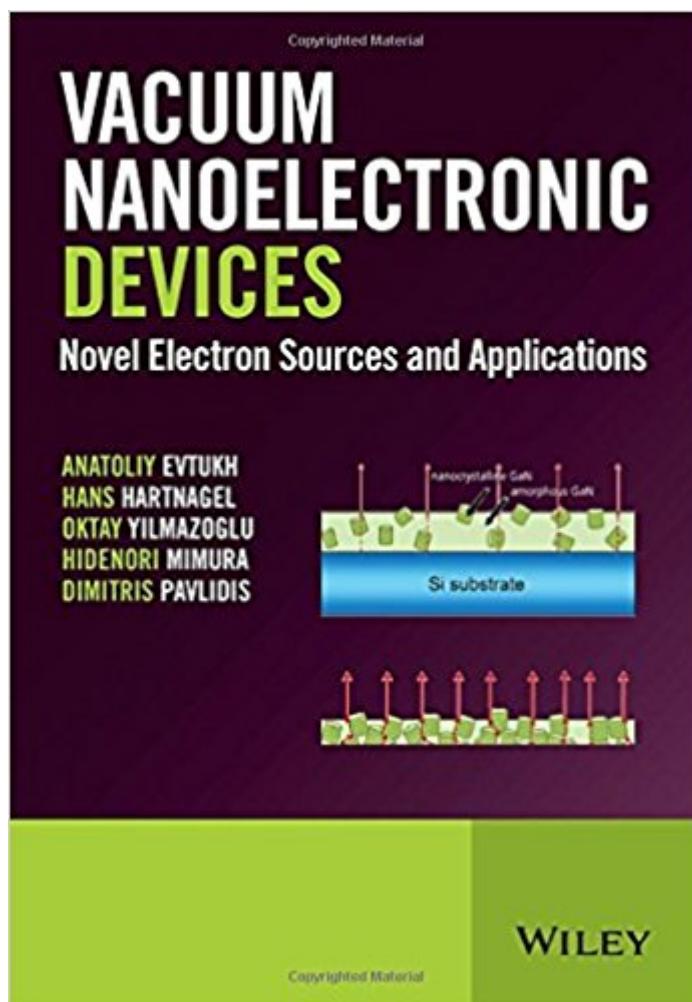


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# Vacuum Nanoelectronic Devices: Novel Electron Sources And Applications



## Synopsis

Introducing up-to-date coverage of research in electron field emission from nanostructures, Vacuum Nanoelectronic Devices outlines the physics of quantum nanostructures, basic principles of electron field emission, and vacuum nanoelectronic devices operation, and offers an insight state-of-the-art and future researches and developments. This book also evaluates the results of research and development of novel quantum electron sources that will determine the future development of vacuum nanoelectronics. Further to this, the influence of quantum mechanical effects on high frequency vacuum nanoelectronic devices is also assessed. Key features:

- In-depth description and analysis of the fundamentals of Quantum Electron effects in novel electron sources.
- Comprehensive and up-to-date summary of the physics and technologies for THz sources for students of physical and engineering specialties and electronics engineers.
- Unique coverage of quantum physical results for electron-field emission and novel electron sources with quantum effects, relevant for many applications such as electron microscopy, electron lithography, imaging and communication systems and signal processing.
- New approaches for realization of electron sources with required and optimal parameters in electronic devices such as vacuum micro and nanoelectronics.

This is an essential reference for researchers working in terahertz technology wanting to expand their knowledge of electron beam generation in vacuum and electron source quantum concepts. It is also valuable to advanced students in electronics engineering and physics who want to deepen their understanding of this topic. Ultimately, the progress of the quantum nanostructure theory and technology will promote the progress and development of electron sources as main part of vacuum macro-, micro- and nanoelectronics.

## Book Information

Hardcover: 512 pages

Publisher: Wiley; 1 edition (September 21, 2015)

Language: English

ISBN-10: 1119037956

ISBN-13: 978-1119037958

Product Dimensions: 6.9 x 1 x 9.9 inches

Shipping Weight: 1.7 pounds (View shipping rates and policies)

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Best Sellers Rank: #2,938,384 in Books (See Top 100 in Books) #72 in Books > Engineering & Transportation > Engineering > Electrical & Electronics > Electronics > Solid State #2293

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Vacuum Nanoelectronic Devices introduces up-to-date coverage of research in electron field emission from nanostructures. It outlines the physics of quantum nanostructures, the basic principles of electron field emission and vacuum nanoelectronic devices operation, and offers an insight into the state-of-the-art and future research and developments. The book also evaluates the results of research and development into novel quantum electron sources, which will determine the future development of vacuum nanoelectronics. Moreover, the influence of quantum mechanical effects on high frequency vacuum nanoelectronic devices is also assessed. Key features:

- In-depth description and analysis of the fundamentals of quantum electron effects in novel electron sources;
- Comprehensive and up-to-date summary of the physics and technologies for THz sources for students of physical and engineering specialties and electronics engineers;
- Unique coverage of quantum physical results for electron-field emission and novel electron sources with quantum effects, relevant for many applications such as electron microscopy, electron lithography, imaging and communication systems and signal processing;
- New approaches for the realization of electron sources with required and optimal parameters in electronic devices such as vacuum micro and nanoelectronics. This book is an essential reference for researchers working in terahertz technology, who want to expand their knowledge of electron beam generation in vacuum and electron source quantum concepts. It will also be invaluable to advanced students in electronics engineering and physics who want to deepen their understanding of this topic. Ultimately, the progress of the quantum nanostructure theory and technology will promote the progress and development of electron sources as a main part of vacuum macro-, micro- and nanoelectronics.

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