# NANO-FET DEVICES: MINIATURIZATION, SIMULATION, AND APPLICATIONS - PART 1

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**Bentham Books**

# Nano-FET Devices: Miniaturization, Simulation, and Applications

## *(Part 1)*

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ISBN (Online): 978-981-5313-80-2

ISBN (Print): 978-981-5313-81-9

ISBN (Paperback): 978-981-5313-82-6



First published in 2025.

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# CHAPTER 1

# Nanoelectronic Horizons: Exploring the Future of FET Technologies with Nanostructures

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**Abstract:** The chapter "Nanoelectronic Horizons" presents a forward-looking exploration of the symbiotic relationship between Field-Effect Transistor (FET) technologies and nanostructures, offering a glimpse into the future of nanoelectronics. Acknowledging the foundational role of FETs in modern electronics, this chapter unfolds the transformative potential that emerges with the integration of nanostructures.

Beginning with a historical overview, the narrative traces the evolution of FET technologies, setting the stage for the contemporary landscape. The foundations of Field-Effect Transistors, including their diverse types and applications, are succinctly explained. The subsequent transition into the realm of nanostructures unveils their unique properties at the nanoscale and establishes them as enablers of advanced functionalities in electronics. The chapter delves into the synergies between FET technologies and nanostructures, emphasizing their role in pushing the boundaries of traditional electronic capabilities. Exploration of recent advancements reveals cutting-edge developments in nanostructure integration, showcasing real-world applications and breakthroughs in research. Challenges and potential solutions in merging these technologies are examined, paving the way for a deeper understanding of the intricate landscape. As the narrative unfolds, readers are guided through the potential impact on various industries, the environmental considerations, and the regulatory landscape. The chapter concludes by envisioning the future prospects of FET technologies linked to nanostructures, offering insights into market trends, technological growth areas, and the societal implications of this transformative journey. Lastly, this chapter serves as a compass guiding readers through the evolving landscape of FET technologies with nanostructures, beckoning towards a future where innovation and collaboration redefine the horizons of nanoelectronics.

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