Resources for Volume 1

This is an accompanying website for the book

Lessons from Nanoelectronics: A New Perspective on Transport

- World Scientific Site * Amazon Site

ne Forum: Questions from Readers

email your questions to datta@purdue.edu. ALL questions are welcome.

rum is open to everyone, no membership is required. *It is updated regularly to include responses to new ons.*

ere to visit the * Q&A Forum, Bottom-up Approach, Lecture 1.

Forum, New Ohm's Law, Lectures 2-5.

Forum, Non-equilibrium Green's Function (NEGF) Method, Lectures 18-24.

Lessons from Nanoelectronics, World Scientific 2012

ded for a broad audience including students and professionals in other science and engineering nes.

load Table of Contents

load Sample Chapters 1-3

III (Lectures 18-23) of this book is devoted to making the NEGF (Non-Equilibrium Green's Function) l accessible to non-specialists.

load Sample Chapters 19-20 on NEGF

t the book is about

ne is familiar with the amazing performance of a modern smartphone, powered by a billion-plus ansistors, each having an active region that is barely a few hundred atoms long.

lectures, however, are about a less-appreciated by-product of the microelectronics revolution, namely eper understanding of current flow, energy exchange and device operation that it has enabled. We

troduce the seminal concepts of nanoelectronics and mesoscopic physics, and

ow how these concepts can be used to obtain many standard results in the transport theory of large ctors in a relatively straightforward way.

econd point represents a new perspective that could be of broad relevance to the general problems of uilibrium statistical mechanics involving the emergence of irreversibility from reversible laws. With this in e have tried to make the key concepts accessible to a broad audience.

0 years ago David Pines in his preface to the Frontiers in Physics lecture note series articulated the r both a consistent account of a field and the presentation of a definite point of view concerning it. That we have tried to provide in this book, with no intent to slight any other point of view or perspective.

ded audience

ts and professionals in any branch of science or engineering. We assume very little background beyond lgebra and differential equations.

dicated graduate students and the specialists, I have written a number of BOOKS in the past.

en the specialists may enjoy these notes taking a fresh look at a familiar subject, emphasizing the s from mesoscopic physics and nanoelectronics that are of general interest and relevance.

are lecture notes in unfinished form. I hope to have a better version in the future, based on your ck and suggestions.

e Course

ng 2012 an online course on the Fundamentals of Nanoelectronics was offered using this book as the elated video lectures, quizzes, homework problems and solutions can all be accessed by going to

ced course on Fundamentals of Nanoelectronics, Part I: Basic Concepts

ced course on Fundamentals of Nanoelectronics, Part II: Quantum Models

luctory videos

mentals of Nanoelectronics, Part I: Basic Concepts

mentals of Nanoelectronics, Part II: Quantum Models

AB codes

codes can be run on MATLAB or on the OCTAViEw tool on nanoHUB.

igures in book

ere to access MATLAB codes for all examples in book

des are organized in folders, titled by the Lecture number.

igures in the article “Nanoscale Device Modeling: the Green’s Function Method”

ere to access MATLAB codes for all examples in the paper S.Datta, Nanoscale Device Modeling: the s Function Method, Superlattices and Microstructures, vol.28, p.253 (2000).