

# E<sup>3</sup>S Legacy – An Electronic Book

**Farnaz Niroui**  
E3S, Theme II



# E<sup>3</sup>S Legacy – An Electronic Book

## OBJECTIVE

Develop a comprehensive educational resource on energy efficient electronics including

**nanoelectronics, nanomechanics,  
nanophotonics, nanomagnetics**

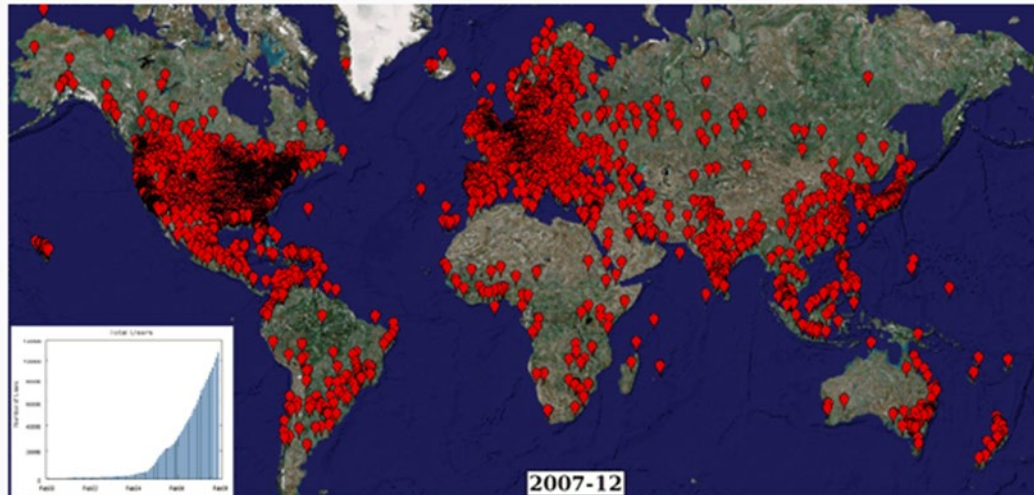
to motivate **high school students** to pursue academic studies and careers in the **STEM fields**



# Platforms for eBook - NanoHUB

Online Portal for Nanotechnology Education  
Created by Purdue University and NSF

Our mission is to support and grow the nanotechnology community and to generate new modes of discovery, innovation, learning, and enagement in the field.



# E<sup>3</sup>S NanoHUB

<https://nanohub.org/groups/e3s>

(Currently not public)

## Energy Efficient Electronics Science

DISCOVERABILITY: HIDDEN JOIN POLICY: CLOSED CREATED: 26 MAY 2016



Group Manager

Overview

Members

Announcements

Blog

Calendar

Collections

Forum

### Overview

#### ABOUT THE GROUP



The Center for Energy Efficient Electronics Science (E<sup>3</sup>S) supported by the National Science Foundation (NSF) combines a broad research and education approach to advance two major fundamental components of digital information processing systems: the communications logic switch and the short-medium range communication of information between logic elements. Four fundamental research areas are explored within this center namely Nanoelectronics, Nanomechanics, Nanomagnetism, and Nanophotonics.

#### GROUP MEMBERS

[View All Members →](#)



Farnaz Niroui



Tsu-Jae King Liu



Michael H. Bartl



Kedrick Perry



Center for E3S



# Tasks and Timeline

Outline	Sept 2016	Email, WebEx Discussion
Assign Authors	Sept 2017	Email, WebEx Discussion



# Theme II – Nanomechanics Outline

Chapter	Title	Assigned Authors
0	Energy-Efficiency Limit of Digital Computing	T. King Liu
1	Introduction to MEMS/NEMS	J. Lang
2	Fabrication of Micro/Nano Systems	M. Sara., J. Patil, F. Niroui
3	Electromechanical Actuators	J. Han, A. Ye
4	Logic Relay Design	U. Sikder, S. Almeida
5	Reliability Limits of N/MEM Relays	B. Osoba, T. King Liu
6	Adhesion in NEM Switch	B. Saha, J. Wu
7	Tunneling NEM Switches – Squitches	F. Niroui
8	The STRITCH-Switch Device	A. Almeida, D. Zubia
9	Relay-based Integrated Circuits	R. Naous, V. Stojanovic
10	Conclusions and Outlook	



# Tasks and Timeline

Outline	Sept 2016	Email, WebEx Discussion
Assign Authors	Sept 2017	Email, WebEx Discussion
Write First Draft	February 2018	MS Word Template, Dropbox



# Template

To keep formatting  
consistent

## CHAPTER #: CHAPTER TITLE

Authors: List the name of the authors for this chapter.

Affiliations: List the authors' affiliations here.

"Section #: Section Title"

Include here the main body of this section. Follow the instructions below for including subsections, figures, equations and references. A brief example is provided on the next page.

[[Image(1-1.png, desc= "This is the caption for image 1.1 for Chapter 1")]]

"Subsection #: Subsection Title"

Include here the main body of this subsection.

"References"

[1] J. O. Lee, Y. Song, M. Kim, M. Kang, J. Oh, H. Yang, J. Yoon, "A sub-1-volt nanoelectromechanical switching device", Nat. Nanotechnol., vol. 8, pp. 36-40, 2013.

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### Instructions for including figures, tables, equations and references:

**Example Section numbering for Chapter 1:** 1.1, 1.2, 1.3, etc

**Example Subsection numbering for Chapter 1:** 1.1.1, 1.1.2, 1.2.1, 1.2.2, etc

**Including figures:** Do not include the figures in the main body of the text. Instead type `[[Image(Image#.png, desc= "Caption here")]]` as a place holder. Upload your images separately to the corresponding dropbox folder. Use the following naming convention for the image files: Image#.png (note: For image number use "Chapter number-Image index", for example the second figure in Chapter 1 will be 1-2)

**Including Equations:** Save equations as image files and follow the same steps as explained above to include the equations in the document. Equations should be in "Cambria Math" font. (If you do not have access to this font let me know)

**Including Tables:** Save tables as image files and follow the same steps as explained above for the figures to include the tables in the document. Tables should be in "Arial" font.

**Including References:** Use IEEE referencing style. An example is shown above.

**Font Styles:** Follow the following formatting to include special font styles.

Instead of **bold** include `"bold"`

Instead of *italic* include `"italic"`

Instead of <sup>superscript</sup> include `^superscript^`

Instead of <sub>subscript</sub> include `_,subscript,`





# Dropbox

To share/compile files

The screenshot shows a Dropbox folder named 'E3S-Theme II-ebook'. The folder contains a series of subfolders labeled 'Chapter 0' through 'Chapter 10', a 'Compiled' folder, 'Final Copies', 'Revision Comments', and a 'Template' file. Each folder and file has a green checkmark next to it, indicating successful upload or verification. The 'Chapter 0' folder is expanded, showing a list of files: '0-1.png' through '0-12.png', 'Chapter 0...II Manuscript', 'Chapter 0...nuscrypt.pdf', 'Chapter 0.docx', 'Eqn0-1.png', and 'Eqn0-2.png'. Each of these files also has a green checkmark next to it.

Item	Status
Chapter 0	✓
Chapter 1	✓
Chapter 2	✓
Chapter 3	✓
Chapter 4	✓
Chapter 5	✓
Chapter 6	✓
Chapter 7	✓
Chapter 8	✓
Chapter 9	✓
Chapter 10	✓
Compiled	✓
Final Copies	✓
Revision Comments	✓
Template	✓
0-1.png	✓
0-2.png	✓
0-3.png	✓
0-4.png	✓
0-5.png	✓
0-6.png	✓
0-7.png	✓
0-8.png	✓
0-9.png	✓
0-10.png	✓
0-11.png	✓
0-12.png	✓
Chapter 0...II Manuscript	✓
Chapter 0...nuscrypt.pdf	✓
Chapter 0.docx	✓
Eqn0-1.png	✓
Eqn0-2.png	✓



# Theme II – Assign Reviewers

<b>Chapter</b>	<b>Assigned Authors</b>	<b>Assigned Reviewers</b>
0	T. King Liu	A. Vidana
1	J. Lang	T. Esatu
2	M. Sara., J. Patil, F. Niroui	S. Almeida
3	J. Han, A. Ye	D. Zubia
4	U. Sikder, S. Almeida	R. Naous
5	B. Osoba, T. King Liu	J. Lang
6	B. Saha, J. Wu	F. Niroui
7	F. Niroui	J. Han
8	A. Vidana, D. Zubia	J. Wu
9	R. Naous, V. Stojanovic	A. Ye



# Tasks and Timeline

Outline	Sept 2016	Email, WebEx Discussion
Assign Authors	Sept 2017	Email, WebEx Discussion
Write First Draft	February 2018	MS Word Template, Dropbox
Internal Review	March 2018	MS Word, Dropbox
Revise Drafts	July 2018	MS Word, Dropbox
External Review	Sept 2018	PDF

High School Students and Teachers



# Tasks and Timeline

Outline	Sept 2016	Email, WebEx Discussion
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Internal Review	March 2018	MS Word, Dropbox
Revise Drafts	July 2018	MS Word, Dropbox
External Review	Sept 2018	PDF
Revise Drafts	Sept 2018	Word, Dropbox

Finalize formatting

**Outline to Revised Drafts  
about 1 year**

Upload

