

# EXPERIMENTS IN MODERN AND APPLIED PHYSICS

■ Web page: <http://www.physics.rutgers.edu/ugrad/389/>

## ■ Instructors:

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# What I do at Rutgers when I am not teaching

- basic research in experimental condensed matter
- Web page of my research group  
<http://www.physics.rutgers.edu/~eandrei/>



STM - Guohong Li  
Adina Luican



Transport - Xu Du  
Ivan Skachko  
Anthony Barker  
Alex Archer

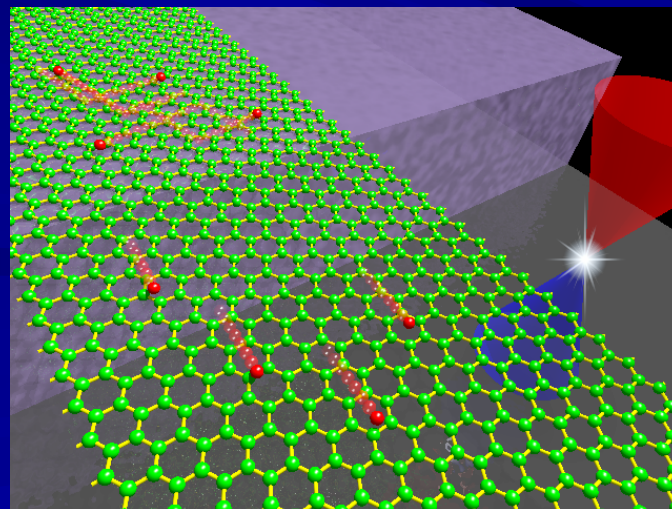
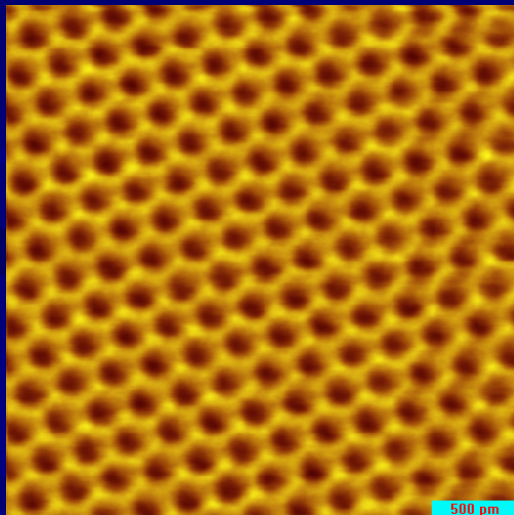


- *G. Li, E. Y. A - Nature Physics, 3, 623 (2007)*
- *X. Du, G. Li, A. Barker, E. Y. A., Nature Nano (July 20, 2008) arxiv:0802.2933*
- *G. Li, A. Luican, E. Y. A., arXiv:0803.4016*
- *X. Du, I. Skachko, E. Y. A. PRB 77, 184507 (2008) arxiv:0710.4984*



# What is our research

- Make and study graphene – a one atom thick Carbon crystal: the thinnest/strongest material known.
- Electrons in graphene behave like relativistic massless particles (tabletop QED)



# Getting started

- First week Sept 4-10
  - Meet with your lab partners
  - Prepare for first experiment
    - All course information is available on the webpage
    - Read references
    - Study lab wroteup
    - Answer preparatory questions
    - Study references on error analysis and start working on homework 1.
    - Obtain Lab book
- First experiment starts Sept. 10

# Experiments and Objectives

- Reproduce experiments that led to major advances in science
- Refine your skills in experimental physics
  - How to obtain good data
  - How to document your work
  - How to estimate errors
  - How to present your results
- As close to real life as possible

# Experiments

- Attendance is required
- You will do:
  - 4 out of 7 experiments
  - Preparatory questions (due on the first day of every new experiment)
  - Oral presentation

# Ethics in science

## ■ Fabrication/Falsification of data

- document everything as you go (Notebook)
- complete record of everything you have done,
- including mistakes

## ■ Plagiarism

- never use other's work without acknowledgement
- Comparison to known values is ok, but not substitution/modification of your data, unless clearly marked
- Use of web resources is encouraged as long as it is properly cited.

## ■ Rutgers new policy on academic integrity

<http://academicintegrity.rutgers.edu/integrity.shtml>

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# Lab partners

Student name	group
LOU, HOU KEONG	1
INNEMEE, SASKIA J	
STANGER, PATRICK M	
HARVU, PAWAN	2
HOGAN, ANDREW J	
LEE, JUNG AH	
KUDELIOVIENE, LARISA	3
LECUN, RONAN Q	
MARKLEY, ERIC C	
PONTER, TIMOTHY S	4
SIU, THEODORE L	
<u>YOUNG, JASON N</u>	
<u>MEYERSON, JUSTIN A</u>	5
<u>RESNICK, DANIEL A</u>	
<u>CAMO, JOHN B</u>	6
<u>SANDHU, ABDULLAH</u>	
CIARAMELLO, JULIANO	7
TAKHISTOV, VOLODYMYR	
MOGILSKI, BRETT A	

# Tour of course webpage