The Horror of the Presentation

- Secret Footage of Speaking Helter-Skelter...

- Horror Stories from the Past
  - Think back to the last presentation or public speaking engagement you were involved with. What made it difficult, and how did you cope?
The Presentation (Before)

- The presentation **starts well before the day of**:
  - Identify and analyze your audience: A big part of targeting groups is to put a specific, and unique touch on your presentation. Ask yourself, what will this particular group understand and how can you catch its interest?
  - Audience typically mostly undergraduates, but graduate students and professors also attend.

- **Repeat** 2-3 take-away key points:
  - Say/show once in beginning, in middle, and in end
  - Research motivation, Value of your results

- Determine the best representation of your ideas:
  - Where do figures explain key points most effectively? What level of detail would your audience benefit most from?
  - Each slide should have a specific purpose
Why do we present our research?

- Excite and convince the academic community of students and faculty on current findings

- Share an idea outside the research group, encourage collaboration, and get funding!

- Practice giving these presentations improves your own public speaking and preparation skills – which is the experience **you will** need for life. 😊
Why is your topic important?

- Explain background at ECE 110 level
  - What motivates your field of research
  - Why does the world need your results?

- Technical clarity is a necessity
  - Analogies are helpful but use simple language

- You should be prepared to talk in detail about:
  - The current problems being tackled
  - Your interesting problem-solving experiences
  - The results of your work
  - How do your results apply to the real world? How do they compare to other solutions?
How to convey scholarly work?

- State the problem and past findings
- Make a picture (best way to fit 1000 words)
- Label all plots and equations with large text
  - Equations: simple, most important equations *only* (e.g. heat equation)
  - Plots: example
- Practice makes perfect
  - Group meetings, mentor-mentee meetings
  - Rehearse presentation with someone or by yourself
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Evidence of Multi-Band Transport from Gate Voltage Dependence

\[ I_D (\mu A) \]

\[ V_{DS} (V) \]

\[ V_{GS} = -50V, -40V, -30V, -20V \]

\[ D \sim 2.5 \text{ nm} \]

\[ L \sim 1.3 \text{ \mu m} \]

A. Liao et al., DRC (2008)
Hysteresis Reduction and Breakdown of Carbon Nanotube Field-Effect Transistors (CNTFETs)

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December 2, 2008
Outline

• Motivation
  – Nanoelectronics: scale down transistor size and reduce power consumption
  – Carbon Nanotubes and Carbon Nanotube Field Effect Transistors (CNTFETs)

• Electrical Characterization of CNTFETs
  – Pulsed I-V characterization
  – Joule heating breakdown

Moore’s Law
Carbon Nanotubes

• Carbon nanotubes (CNTs) are 1D tubes of hexagonally arranged carbon atoms

• CNTs feature extraordinary electrical conductivity (~10 times Cu/Ag) and thermal conductivity (similar to $C_{\text{diamond}}$)

• Less heat dissipation $\rightarrow$ closely packed transistors $\rightarrow$ satisfy Moore’s law

Diamond (top left), graphite (bottom left), & SWNT (right) structural comparison
The Presentation (During)

- Arrive comfortable and prepared:
  - Arrive on time, well dressed, and ready to present
  - For group presentations, know who is presenting what

- Make it memorable
  - Note your audience’s demographic, and interact as necessary
  - Use visual examples; avoid expletives

- Stay within the time limit
  - 5 minutes per person; up to 5 minutes for questions
  - Some detail may have to be cut out
The Presentation (After)

- Entertain all questions and don’t argue with the questioner. Repeat the question so everyone hears it.

- The question and answer session is your last chance to teach and learn from your audience.

- Acknowledge your mentor and advisor, and anyone else who helped you along the way.

- Make sure you finish within the allotted time and thank the audience.
Key Points

- **Where to start?**
  - Pick 2-3 key points

- **During the presentation**
  - Motivate your topic with relatable examples
  - Revisit those 2-3 key points in the introduction, body, and conclusion

- **Use visuals to convey your point**
  - Clearly labeled figures
  - Introduce equations in moderation
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- Celia Elliot, PHYS 496 instructor
- David Hertzog, PHYS 496 creator
- T. J. Dolan, NPRE 421 Technical Presentations talk
Follow-up

- Use the department’s PowerPoint template

- PURE Archive contains past presentations

- ECE Undergraduate Research Symposium (April 14, 21, and 28)

- You are welcome to share examples

- Find this presentation on PURE website; feedback and future volunteers appreciated