6.978. Final Meeting 12 December

- Today: Final Class in Course 6.978

  - Status of Projects
  - Activities During IAP
  - Some Opportunities Looking Ahead
  - Reading References
  - Time for Questions
  - Course Feedback Questionnaire
  - Class Photos!

- Project Status:

  > 19 Projects got onto chip set: let me mention so you know for sure:
  
  > one by Brock, Boughton, Brynt, & Levin;
  
  > Cherry, Colm, Frank, Frenkel, Hiratsuka, Lam, Levitt, Olson, Perea, Raylance, Shaver, Snyder, Steele, Stern, Yang;
  
  > one by Bowen, Ajoyra, & Rubinstein;
  
  > one by Goldfinger & Westbrook.

  > 6 projects didn’t make it. These were ones for which I didn’t have enough project report info to evaluate, or which were finished up right
  
  > rear the last minute. Some of these were very interesting and you might try to get them onto future M.I.T. chip sets.

  > Things now look quite good for return of completed wafers by early to middle January. I can’t promise that, but it will likely happen.

  > So, that brings us to activities during IAP.
IAP: Assuming that we face return during early IAP, there will be two major activities during IAP:

1. Packaging & electrical testing by faculty/staff in the Materials Science area.

2. Functional Testing, organized by Prof. Jon Allen. Dimitri Antonadis will discuss plans for the use of packaging.

Jon Allen will discuss plans for the electrical testing.

HANDOUT QUESTIONNAIRE FOR INFO

LET'S GET A LIST OF STUDENTS WHO HAVE PROJECTS ON THE CHIP SET WHICH THEY WISH TO TEST:

NAME, WHERE CAN BE REACHED DURING IAP (INCL PHONE), DO YOU WISH TO JOIN JON ALLEN'S EFFORT OR DO YOU PLAN TO TEST INDEPENDANTLY?

WE WILL PACKAGE & SEND UP SEVERAL CHIPS FOR EACH STUDENT IN THIS GROUP.

ALSO, NOTE: I WILL FAVOR TESTED PROJECTS FOR WHICH I'VE RECEIVED ARTIFACTS, WHEN I RUN OFF MORE ARTIFACTS (VERSATILE PLOTS, SOLID COLOR PLOTS, ETC.). I.E.: LET ME KNOW IF IT WORKED, OR IF NOT, WHAT YOU FOUND OUT WENT WRONG.

Include Address & Phone if any.

ARTIFACTS: INCLUDE ADDR. WHERE I CAN MAIL ARTIFACTS. I'D LIKE EVERYONE TO HAVE A FEW UNMOUNTED CHIPS - BE SURE TO LOOK AT THEM UNDER VARIOUS MICROSCOPES - AND MORE PLOTS OF YOUR PROJECT - E.G. COLOR PLOTS. IF YOU AREN'T GOING TO BE AROUND IN THE SPRING - SO INDICATE - AND SEND ADDRESS LATER.

MY ADDRESS AFTER FEB 18TH WILL BE --- PACE ---
ANY QUESTIONS ON PROJECTS? IAP? ETC.

LOOKING AHEAD: OPPORTUNITIES:

Grad. work; Teaching; Research; Development; Entrepreneur.

Projects, right now: helping an area grow; participating in expediting the academic/industrial collaboration.

I'm helping do this right here at M.I.T. For example, participation in next fall's course.
**Reading References:**

I brought along several of the recommended reading references, and I'd like to comment a bit about them: [You might want to look at New after class to see if you think they're interesting.]

Now that you are really on top of this material, you might want to add a few of these to your library - for expanding your background further into adjacent fields, or for future reference.

- **Sci. Amer:** Special issue on Microelectronics Sept '77. Is available in reprinted hard-cover form.

  Very good general background reading, and to show others what this area is all about. Lots of pictures.

- **A. S. Grove, "Physics and Technology of Semiconductor Devices.**
  A bit dense, but still the classic on process technology and device physics. Excellent reference.

- **P. Richman, "MOS Field Effect Transistors and Int. Circuits.**
  Very readable, excellent reference text & tutorial text on MOS-FET's. Excellent supplement to CH. 1.

- **Penney & Lau (Eds) "MOS Integrated Circuits.**
  An early general text on MOS-LSI. Contains useful info. A lot of info on inverter characteristics, etc.

- **TI, "Semiconductor Memory Design & Application.**
  If you're interested in memory subsystems, consult this reference.

- **Evi Kohavi: "Switching & Finite Automata Theory, Second Edition.**
  Bell & Newell "Computer Structures: Reading and Examples."
  A classic encyclopedia work on computer architecture. Lots of history and examples. A new edition is about to come out - a recommended buy. Not much of history on int. circ. / int. syst., but still very interesting.

- **And, of course: NEXT SUMMER, RES.CAP; BUY MEADS CONWAY**
• LET’S TAKE 10 MINUTES -- FILL OUT COURSE FEEDBACK QUESTIONNAIRE.

  NOTE: CROSS OUT REC. INSTRUCT. \(\rightarrow\) REPLACE LECTURED: LYNNE CONWAY
  • PUT N.A. IN T.A.
  • PUT N.A. IN ITEMS 11, 12.

• TIME FOR ANY REMAINING QUESTIONS / COMMENTS ABOUT COURSE, FIELD, ETC.

• BEFORE YOU ALL TAKE OFF -- I WANT YOU TO KNOW WHAT A GREAT EXPERIENCE THIS HAS BEEN FOR ME -- IT'S BEEN A REAL PRIVILEGE TO TEACH SUCH A FINE GROUP OF STUDENTS.

  INDIVIDUALLY AND AS A GROUP YOU'VE ACCOMPLISHED PAR MORE, 5 IN MUCH LESS TIME THAN ANY OF THE OTHER SCHOOLS. I'M VERY PROUD OF YOUR ACHIEVEMENTS.

  I have a feeling that some great things will be done --- by students in this class -- I'd enjoy hearing about your adventures in the future.

  I'd really like to remember you all -- and I'd appreciate it if you'd let me take a couple of pictures of the whole class -- --

• AFTER CLASS: I've got reference books here if you want to look at them, and also some previous pop chips for those who haven't had a chance to look at them.