

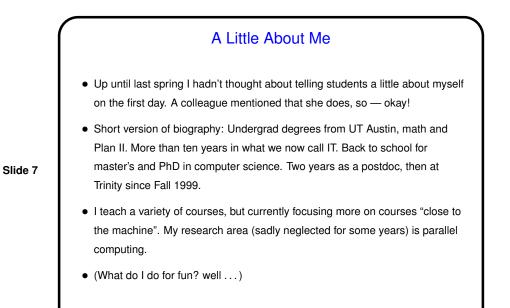
## Course FAQ, Continued

- Why are we using "my" book when there are books that are more textbook-like, and also more recent? because I think it comes closer than any other book I know to covering the material I think is perhaps best learned from a book.
- (And no, I'm not getting rich off the royalties! though extra income is not unwelcome.)

## Course FAQ, Continued

• "What computer(s) can I use to do homework?"

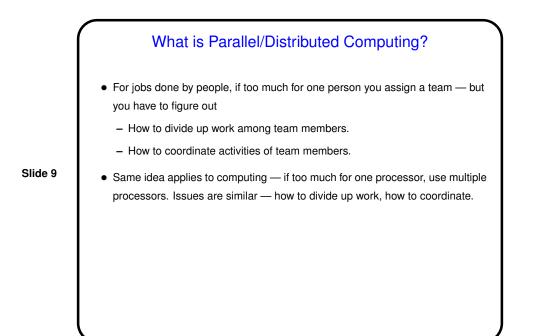
Easiest option may be department's Linux machines. You should have physical access via your TigerCard to all the classrooms and labs (probably not today but soon) any time the building is open. You should also be able to log in remotely to any that are booted into Linux, or to a cluster of Linux-only machines in ITS's server room (names diasnn, where nn ranges from 01 to 05). To log in from off-campus, we are currently recommending that you use ITS's VDI.

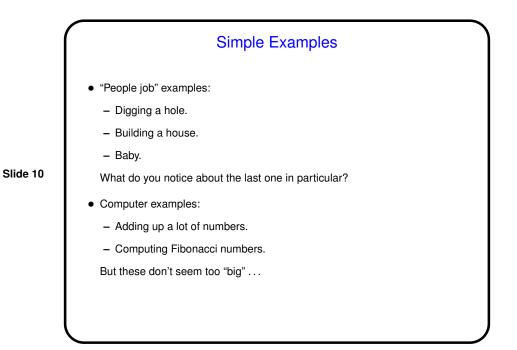


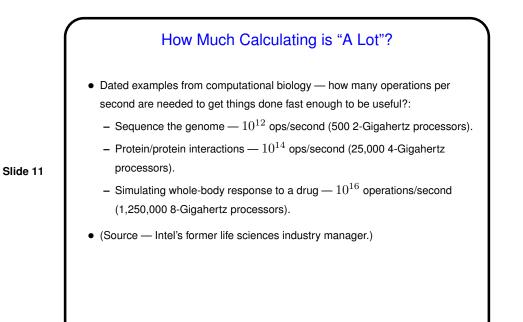
What is Parallel/Distributed Computing?

 Some computational jobs are just too much for one processor — no way to get them done in reasonable time.

• For jobs done by people, what do you do when the job is too much for one person?





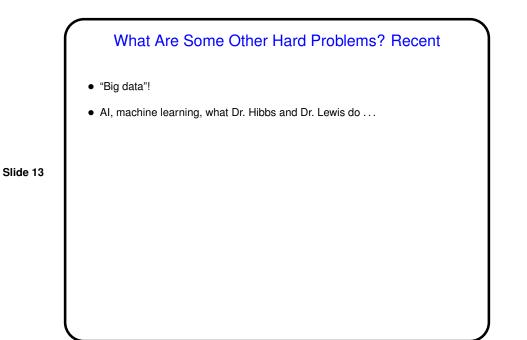


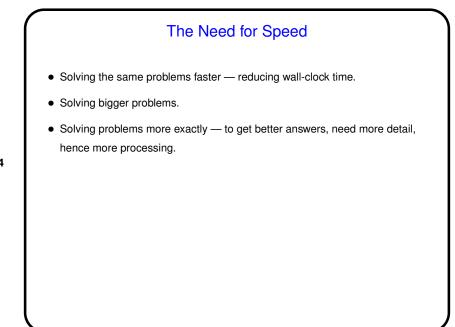
What Are Some Other Hard Problems? Traditional HPC

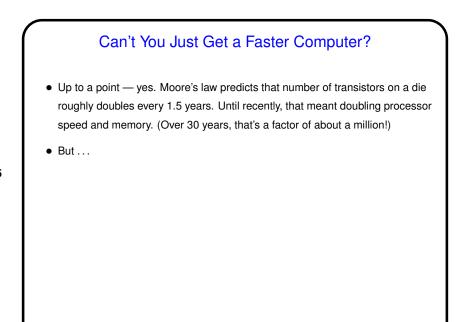
- Crash simulation / structural analysis.
- Oil exploration.
- Explosion simulations (why Los Alamos is interested).

• Astrophysics simulations (e.g., Dr. Lewis's work on Saturn's rings).

- Fluid dynamics.
- "Rendering" for computer-generated animation.
- And many others ...

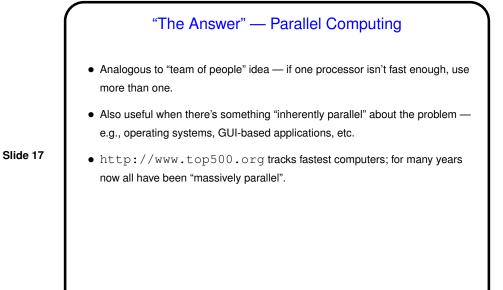


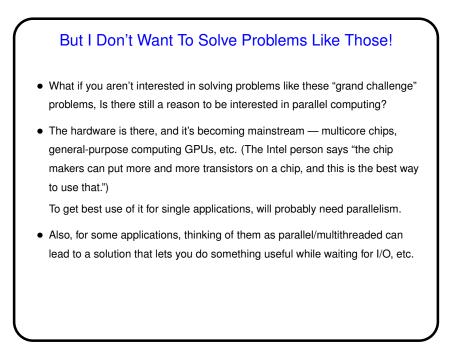


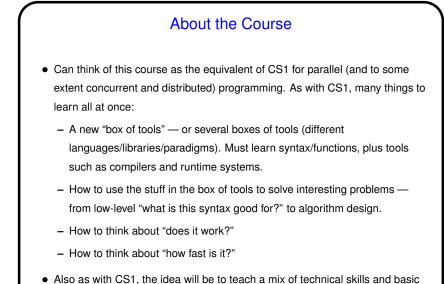


## Can't You Just Get a Faster Computer? continued

- As you know however fast processors are, it's never fast enough, and faster is more expensive.
- Eventually we'll run into physical limitations on hardware speed of light limits how fast we can move data along wires (in copper, light moves 9 cm in a nanosecond — one "cycle" for a 1GHz processor), other factors limit how small/fast we can make chips.
- Maybe we can switch to biological computers or quantum computers, but those are pretty big paradigm shifts ...
- In the past few years, chip makers are still able to put more transistors on a chip, but they seem to have run out of ways to exploit that to get more speed, and are instead making chips with multiple processing elements ("cores" for computational chips, other elements in GPUs).







Slide

• Also as with CS1, the idea will be to teach a mix of technical skills and basic concepts, with emphasis on learning by doing.

Minute Essay
• (Most lectures will end with a "minute essay" — as a quick check on your understanding, a way for me to get some information, etc., and also to track attendance. Just put your answer in the body of the message; no Word documents please, and put "minute essay" and the course in the Subject line.)
What are your goals for this course?
• Are you reasonably comfortable with C? How about C++? (There will be assignments using one or the other.) How about Java? In the past I've had students do an assignment in Java, but this year maybe it should be Scala?
• I'm told that our CS2 course now includes some exposure to multithreaded programming? What do you remember from that, and do you have other experience with any kind of parallel or distributed programming?
• Anything else you want to tell me? about the course, about what you did over the summer