

+Welcome to Michigan!!!

+It is always a pleasure to have the opportunity  
+to welcome new graduate students to the  
+University...since, way back when I had an  
+honest job as a faculty member, it was in  
+a small department that primarily focused  
+on graduate education.

+Indeed, my most valuable colleagues and  
+closest friends were always my PhD students...  
+which is natural, I suppose, because the  
+bonds between faculty and graduate students  
+are particularly strong in almost every  
+discipline.

+We worked together...played together...and learned together...

+The Excitement of Graduate Study

+Many of you are making that proud transition from  
+undergraduate to graduate student...

+Thinking back, almost 25 years ago when I make  
+the same transition, I can recall many of my  
+reactions at the time...

+1. The very rapid sense of responsibility and  
+control. Graduate students are expected to  
+possess the intellectual maturity to determine  
+their own course of study -- to set their own  
+pace...

+2. The intellectual excitement--of being able to  
+dig into a subject as deeply as you choose!

+3. The quality of student colleagues...I made the  
+transition from Yale to Caltech. When I left Yale,  
+I felt that I was at the top...only to find at Caltech  
+that students from renown institutions like Southern  
+University of North Dakota at Hoople were capable of  
+blowing my socks off -- as were the Caltech  
+freshmen in some of my classes. It was a humbling,  
+though important, experience...

+4. The sense of collegiality with the faculty.  
+In a short time, many of you will have acquired  
+knowledge in a narrow area that exceeds your  
+faculty advisor. At this stage, the learning  
+relationship passes from a parent/child to  
+a peer-to-peer nature...and you become a  
+collaborator and a colleague.

+(Although I would note that this biological relationship  
+model seems to apply in tracking the family tree  
+among PhDs...

+For example, I can trace my own PhD heritage

- +back to Von Karman...
- +while I can also count some 22 PhD children
- +...and perhaps another 50 PhD grandchildren...
- +5. Actually, graduate study is one of the most
  - +exciting periods in your intellectual development
  - +since you will rapidly
  - +become a master in your chosen area of study...
  - +and indeed can draw on the reputation of the
  - +institution and your faculty colleagues...yet
  - +you are not subject to the other pressures of a
  - +faculty position -- e.g., pressure to achieve tenure.
- +Hence, as you take those first steps down the
  - +exciting trail of a college education, perhaps it is appropriate
  - +for the President of the University to pass along a few pearls
  - +of wisdom...
  - +Actually, I would never dare give you any words
  - +of advice from my perspective as the
  - +University's supreme bureaucrat.
  - +But, as a faculty member, I have spent almosts 20 years
  - +teaching and advising graduate students...
  - +...so let me comment from that perspective
- +1. Michigan is not a small liberal arts college...it is a
  - +**great research university**.
  - +It is also a very large, complex, and exciting place.
  - +Some parameters of the University
  - +Parameters:
    - +Enrollment: 35,000 (Ann Arbor) (47,000 total)
    - +Faculty: 2,600 (14,000 employees)
    - +Budget: \$1.5 billion
    - +Academic Units
      - +17 Schools and Colleges
      - +Hundreds of research centers, institutes,
      - +and other types of interdisciplinary
      - +programs
    - +We also run the largest health care system in
      - +the Midwest, treating over 750,000 patients each year...
    - +We conduct events in the performing arts which rival
      - +New York and London...
      - +whether it be Leonard Bernstein performing his 70th
      - +birthday concern with the Vienna Philaharmonic
      - +or, God-forbid, the Grateful Dead....
    - +And, speaking of entertainment, we also have the
      - +Bo and Steve show...the Michigan Wolverines...
      - +playing in the fall to 105,000 every Saturday afternoon
    - +Or, in the winter and spring, to every household in America...
      - +...at least if we make the Final Four....

+Mission:

- +i) Provides instruction, research, service
- +ii) Spans all intellectual disciplines and  
+professional areas
- +iii) Attempts to conduct programs that rank  
+among the nation's best in all areas  
+(and succeeds...)

+On this campus, we provide one of the most  
+incredible intellectual smorgasbords in  
+the world--a fascinating cornucopia of  
+ideas supported by some of the finest  
+facilities in the world -- one of the nation's  
+great libraries, museums, laboratories,  
+computers, concert halls,  
+athletic facilities -- and even more  
+important, one of the world's great  
+faculties.

+3. Importance of diversity to this campus

+UM has made a very deep commitment to the achievement  
+of an environment which seeks, nourishes,  
+and sustains racial, cultural, and ethnic diversity.

+We believe it essential to develop an environment of  
+mutual understanding and sensitivity on this campus  
+that not only tolerates diversity, but moreover seeks  
+and embraces it as one of our most cherished  
+characteristics.

+There seems little doubt that America of the 21st  
+century will probably be the most pluralistic,  
+multicultural nation on earth...and perhaps in the  
+history of civilization...

+It will be a nation of peoples of vastly different backgrounds,  
+cultures, and beliefs...peoples seeking to retain  
+their cultural roots...to maintain their identities

+On this campus many of you will encounter for the  
+first time in your lives the remarkable diversity and richness  
+of peoples of different races, cultures, religions,  
+nationalities, and beliefs.

+One of the most important things our students must learn  
+on this campus is to respect others for their  
+differences...as well as their similarities...

+To learn how to resist the great pressures of separatism,  
+fear, and bigotry which push us apart...  
+...and instead commit themselves to a university...  
+...indeed, to a nation, committed to working together,  
+united by a common set of beliefs and visions.

+Michigan is first and foremost a "UNI" versity.

- +Hence view our challenge...and the challenge before
- +your sons and daughters...as learning how
- +to weave together these dual objectives
- +of diversity and unity in a way that strengthens
- +our fundamental goal of academic excellence
- +and serves our society.
- +In a very real sense, we believe that Michigan has a
  - +mandate to serve as both a microcosm and leader of
  - +society at large..
- +We believe in and we are committed to a diversity in our
  - +people, in our activities, in our intellectual endeavors,
  - +which mirrors the great diversity of our nation
  - +and the world...
- +But we also believe that our university has a special
  - +responsibility to develop effective models of
  - +multicultural communities, in which peoples from
  - +vastly different backgrounds study together and
  - +learn together.
- +We believe that this commitment to diversity and unity is
  - +key to the quality and distinction of this
  - +University--and to the quality of the education
  - +your sons and daughters will receive.
- +For that reason, it is absolutely paramount that our
  - +students, just as our faculty and staff,
  - +demonstrate the sensitivity and tolerance toward
  - +others of differing races, cultures, and nationalities...
  - +and seek to learn from this remarkable diversity
  - +of people and ideas on this campus.
- +This will be an essential component of their
  - +education.
- +4: Pride in Place
  - +The University of Michigan is a very special place
  - +This campus represents the investment...
    - +the sweat and tears...or over 8 generations of Michigan citizens.
  - +Each of us, as students, faculty, or staff will benefit from
    - +this heritage of excellence and commitment...
  - +But each of us has, as well, a personal responsibility to
    - +sustain and improve this university so that future generations
    - +can benefit as we did.
  - +In particular, over the past several years we have made some
    - +extraordinary investments aimed at providing you, as
    - +undergraduates, with some truly spectacular facilities.
  - +Examples:
    - +i) This month we are opening up the new Dow Laboratories...
      - +a \$60 million facility
    - +ii) This summer we opened up the largest computer

- +cluster in the nation...the Computer Cathedral...
- +with millions of dollars of the most sophisticated
- +computer equipment for you to use...
- +iii) We are finishing a major renovation of the UGLI
- +iii) We are methodically going through the Central
  - +Campus and renovating all classroom space...
  - +...as evidenced by the 4 new auditoriums in Angell Hall
- +iv) And we are making a very major effort to clean up the
  - +grounds of the campus...
- +Yet, without your help, this is all for naught...
- +Unless you help us take care of thi
- +5. The role of graduate students
  - +Graduate students play many roles in a research
    - +university:
      - +students
      - +teaching assistants
      - +research assistants
      - +faculty colleagues
    - +You will soon be confronted with several of the age-old
      - +tensions which surround university faculty...
    - +Perhaps the most important of these is the perceived
      - +tension between scholarship and teaching...
      - +I suspect that all of you have confronted at times the
        - +competing demands posed by your teaching assignments
        - +and your thesis research.
      - +Of course, as faculty members, you will also experience
        - +the same challenge between scholarship and teaching
        - +throughout your academic career.
    - +All too often we are inclined to point at this tension
      - +between teaching and research as something unhealthy...
      - +as something detrimental to the quality of education...
    - +However, let me suggest that it is instead, the very
      - +cornerstone of what makes education at a research university
      - +so very important...
    - +For unlike small liberal arts colleges, a major research
      - +university like Michigan expects all of its faculty to be
      - +active scholars...and to bring that perspective formed from
      - +the continual struggle to extend mankind's knowledge into
      - +the classroom.
    - +Indeed, I believe that the unique character of the
      - +education at this institution is due to the manner in which
      - +we strive to bring together talented undergraduates with
      - +active scholars...thereby exposing them to the excitement,
      - +challenge, and occasionally, the frustration of scholarly
      - +inquiry.
    - +This is what makes Michigan...and Berkeley, and Stanford,

- +and Harvard...such important institutions in our society...
- +And this is what makes your role as developing
  - +scholar-teachers so important.
- +6. Finally, let me suggest something else that
  - +may sound almost sacreligious in the tradition-bound world
  - +of graduate studies.
  - +Since this will be one of the few occasions in your life when
    - +you are relatively unconstrained--at least in an intellectual
    - +sense--try to inject a sense of daring and adventure in
    - +your work...
  - +Try to be creative and imaginative...
  - +I don't know how many of you have ever read Thomas Kuhn's
    - +book on the nature of scientific revolution, but Kuhn
    - +points out that most scholarship is really quite traditional...
    - +it is really not designed to produce major novelties.
  - +Progress is not gradual, but rather occurs through revolution...
    - +through dramatic changes from one way of thinking...
    - +from the old "paradigm" as Kuhn puts it, to the new "paradigm"
  - +As Kuhn puts it, those scholars who achieve the fundamental
    - +inventions of a new paradigm have been either very young or
    - +very new to the field whose paradigm they change. These are
    - +the individuals who, being little committed by prior practice to the
    - +traditional rules of normal scholarship, are particularly likely to
    - +see that those rules no longer define a playable game and to
    - +conceive another set that can replace them.
  - +In a sense, try something new before you fall into the same
    - +ruts that have trapped the rest of us.
- +7. Working on the Exponential Part of the Knowledge Curve
  - +There is yet one other theme that I want to suggest
  - +This term comes from a simple model of the growth
    - +of knowledge in a field over time as the
    - +familiar S-shaped curve.
  - +In the early stages, the growth of knowledge
    - +is exponential with time, since the more you learn,
    - +the more rapidly the rate of knowledge
    - +increases...
    - +At this early stage, a few individuals of
    - +exceptional ability and great intellectual span can
    - +have truly extraordinary impact, essentially
    - +stimulating and defining entirely new fields
    - +of knowledge...
    - +This is the "high risk" area...since it can frequently
    - +take years (in addition to great talent) to achieve
    - +something...
  - +As a field matures, the growth in knowledge
    - +becomes linear with time....

- +In this stage, the more resources you
- +throw at an area...the more people or
- +dollars...the more you learn...
- +(I usually refer to this as the Michigan region
- +of the knowledge curve...you might prefer to
- +call it the MIT region instead...)
- +This is where it is "safest" to work...
- +easiest to get grants and to achieve tenure...
- +As the field matures still further, the growth in
- +knowledge tails off...it saturates...a law
- +of diminishing returns sets in as one mines
- +most of the new knowledge out of a field.
- +All too often, many of us get trapped in this
- +regime...essentially trapped in a rut.
- +Some of my colleagues suggest there may be
- +a fourth phase...they refer to it as senility...
- +where continuing to work in a field actually
- +is counterproductive and reduces its knowledge
- +content.
- +(Actually, there have been times recently when I've
- +begun to wonder if my old field, nuclear fusion, has
- +entered this final phase of intellectual evolution of late...)
- +All too often people...and institutions... tend to regard
- +their role more as the keepers and transmitters
- +of existing knowledge than as the
- +creators of new knowledge...and chose to work
- +only on the safe problems.
- +But you, as graduate students, not only have the talent...
- +but also the education to work down in
- +the high-risk, exponential part of the knowledge curve...
- +8. Fun
- +Oh, and one more thing...Try to have some fun in your graduate
- +studies...it can be one of the most enjoyable intellectual
- +experiences of your lives.
- +Michigan is an exciting, challenging...sometimes
- +**frustrating...but always rewarding place.**
- +Let me wish you the best as you start the fascinating
- +and rewarding experience of graduate study at Michigan.
- +Once again, congratulations on your accomplishments...
- +and we wish you the best as you pursue your careers as
- +future members of the academy.