Achieving the Vision

ILSAMP Student Research Symposium

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A little about myself...

Currently:

Lederman Fellow at the Fermi National Accelerator Laboratory

- ✗ Primary focus of study is elementary particle physics and advanced statistical analysis techniques

Previously:

B.S. in Physics & Math, S*umma cum Laude,* University of Minnesota (1997-2000)

Ph. D. in Physics, Princeton University (2000-2004)

Post-doctoral studies, Princeton University (2004-2005)

Achieving the Vision

- The woes of the graduating graduate student
  - !!Graduating!!
  - Leaving the nest
- Next steps
  1) **Envisioning your path**
  2) **Choosing your path**
  3) **Navigating your path**

Finding Your Vision

- This is usually the easy part
  - You're already on a path. Just need to look ahead a few steps....
  - An important opportunity for truthful introspection
- Thinking back
  - What brought me to my field in the first place?
  - What have I learned since then?
- Thinking ahead
  - What do I need to satisfy myself?
  - Where can I find it?

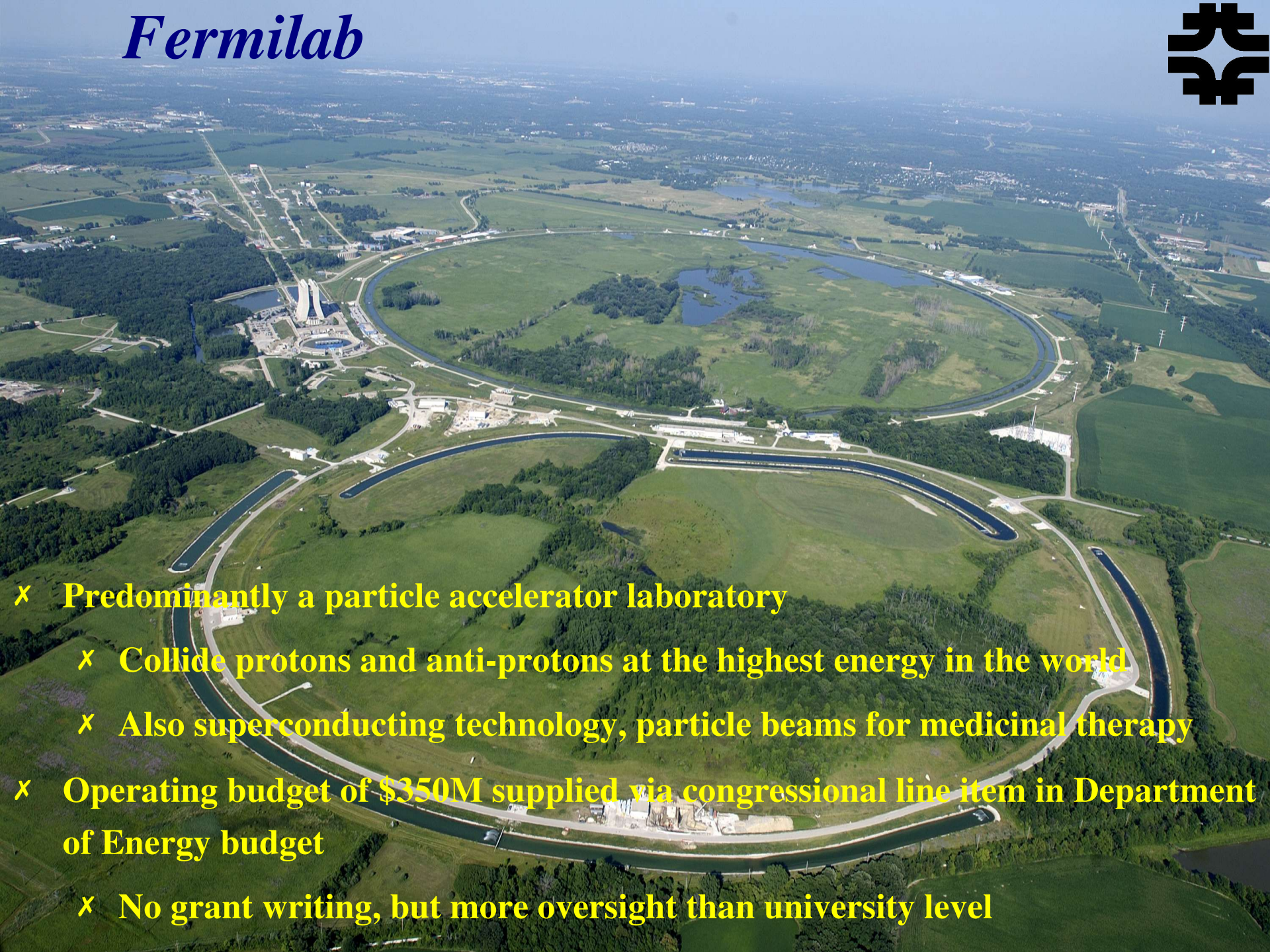
Choosing Your Path

- There are many paths to each destination
  - Don't worry that you're on the wrong path!
    - ***As long as you're learning, you're going in the right direction***
- Two (of many) options
  - University
  - National Lab
- Other options
  - Industrial research
  - Consulting
  - Entrepreneurial enterprise

Fermilab

- Basic research laboratory
  - Focus on study of the fundamental forces and particles of nature
- 2102 employees (1289 PhD)
  - Physicists
  - Engineers (electrical, computer, software, ...)
- 2300 visiting researchers
  - Primarily university researchers
  - Europe, Asia, North & South America

Fermilab



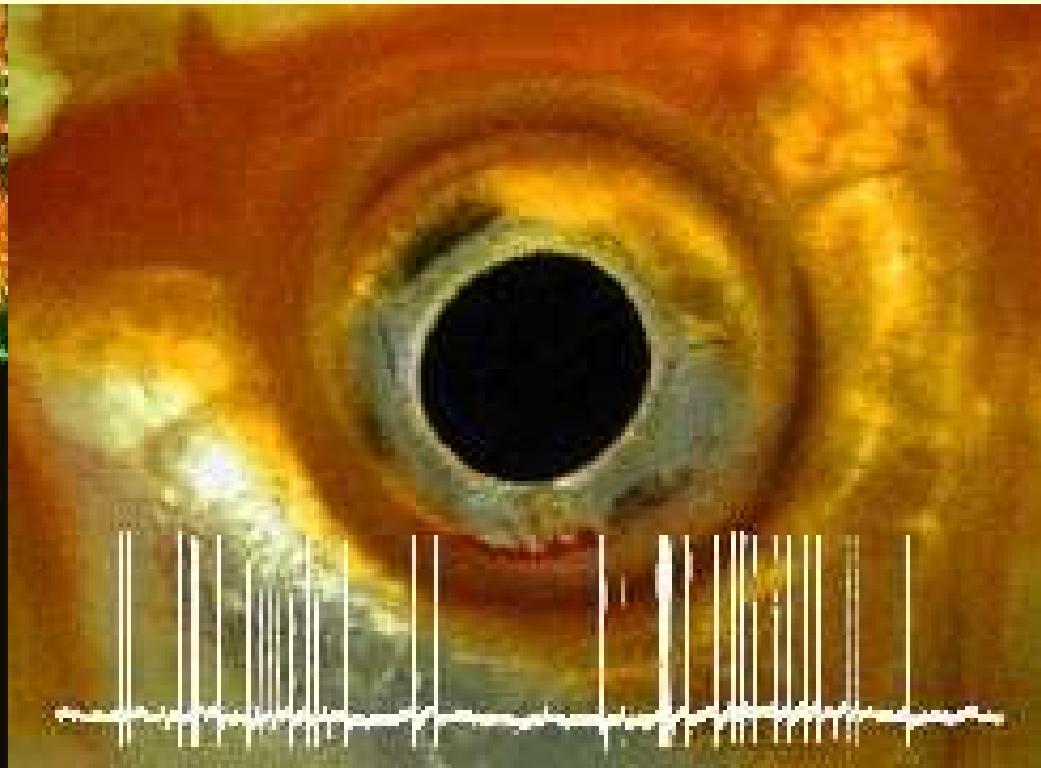
- Predominantly a particle accelerator laboratory
  - Collide protons and anti-protons at the highest energy in the world
  - Also superconducting technology, particle beams for medicinal therapy
- Operating budget of $350M supplied via congressional line item in Department of Energy budget
  - No grant writing, but more oversight than university level

University Research

- The academic environment is essential for some people
  - ***You understand a topic best when you must teach it!***
  - Very high flexibility in research and time commitment
  - Grant requirements vary by field

University Research

- Interdisciplinary collaboration is invaluable...
  - ...as a source for inspiration
  - ...as a fountain of new ideas and solutions
    - ***problems can always be viewed in different ways***



Following your Path

- Finding opportunities
  - Apply, apply, apply, apply!
    - ***If you don't ask for a job, you probably won't get it***
  - Don't sell yourself short (don't be shy!)
    - ***Be confident, but realistic***
    - ***Always be professional***
  - Be flexible
    - ***You may discover a new passion***
  - Word of mouth can be the key
    - ***Talk to colleagues, professors, friends also in your shoes, etc...***

Following your Path

- Get experienced!
  - If you are already doing research, good!
    - ***Don't hesitate to try something new...***
  - If not, consider getting involved
    - ***Most research jobs pay $$$***
    - ***Consider other universities, national laboratories to find what you want***
  - This is your "sneak peek" at what lies down your path
    - ***You often need to search a bit, pound on doors, or volunteer***
    - ***Be willing to "think outside the box".....bring new ideas.....don't be afraid of looking foolish!***

Final Thoughts

- Follow your head ***and*** your heart
  - ***Your path is easier to find if you're willing to be introspective and honest***
- There are no one-way paths
  - ***Keep an open mind and don't be afraid to change directions***
- Be excited about what you've chosen
  - ***STEM fields are dynamic and exciting, let them inspire you***