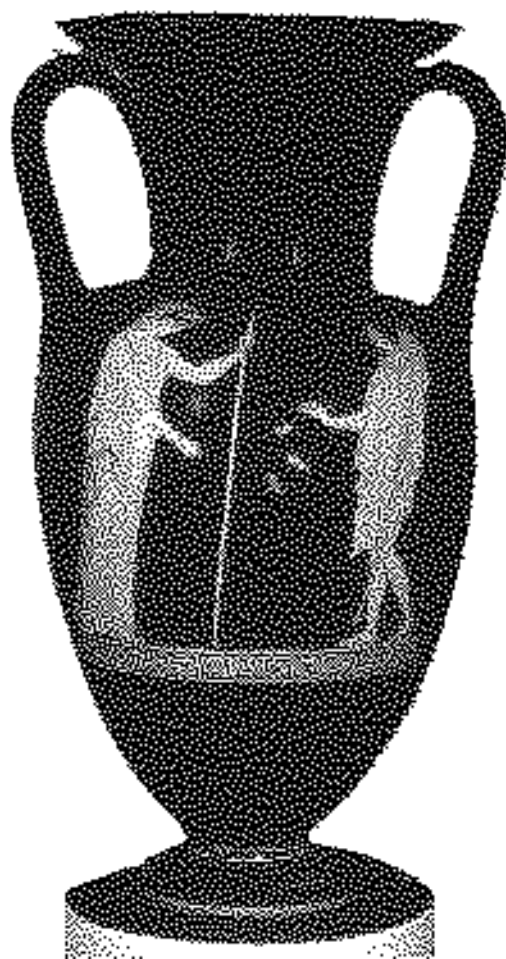




**PHYSICS: CLASSICS DEPARTMENT
OF THE FUTURE?**

*Eric Mazur
Harvard University*

*National Science Foundation
9 June 1998*



PHYSICS: CLASSICS DEPARTMENT
OF THE FUTURE?

Eric Mazur
Harvard University

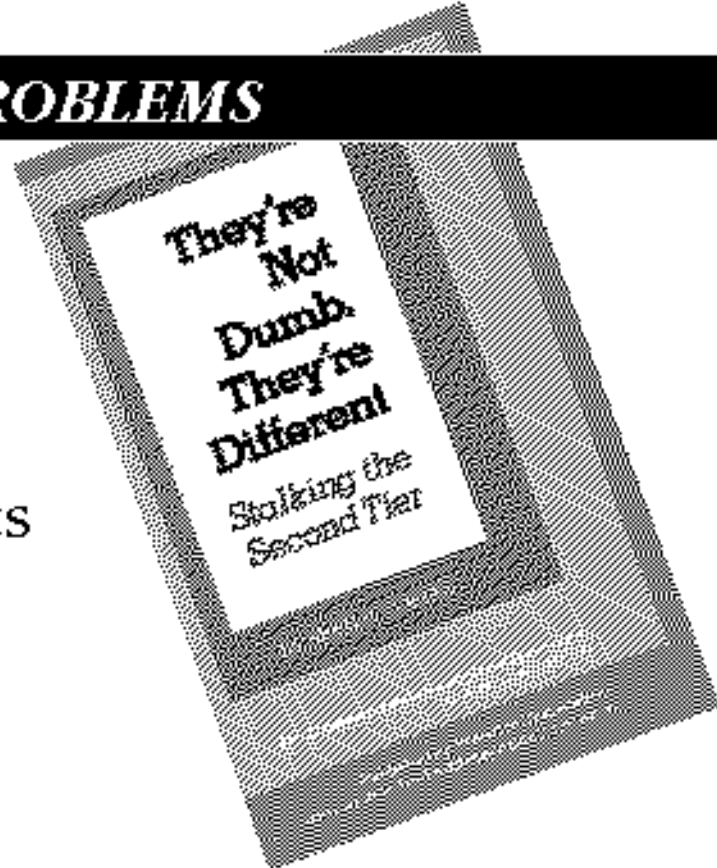
National Science Foundation
9 June 1998



- ➊ Some problems...
- ➋ Some more problems...
- ➌ Challenges

SOME PROBLEMS

- declining support
- declining enrollments
- frustration



FRUSTRATION



FRUSTRATION

“In a perfect world...

...algebra would actually come in handy.”



FRUSTRATION



FRUSTRATION

Well, hot is a relative term. You see, given temperatures rise regardless of mass. Yeah, Galileo observed rising temperatures will decrease with the exposure of an endothermic source. True transparency will persist until this one irresistible calorie interacts thus altering the system.



FRUSTRATION

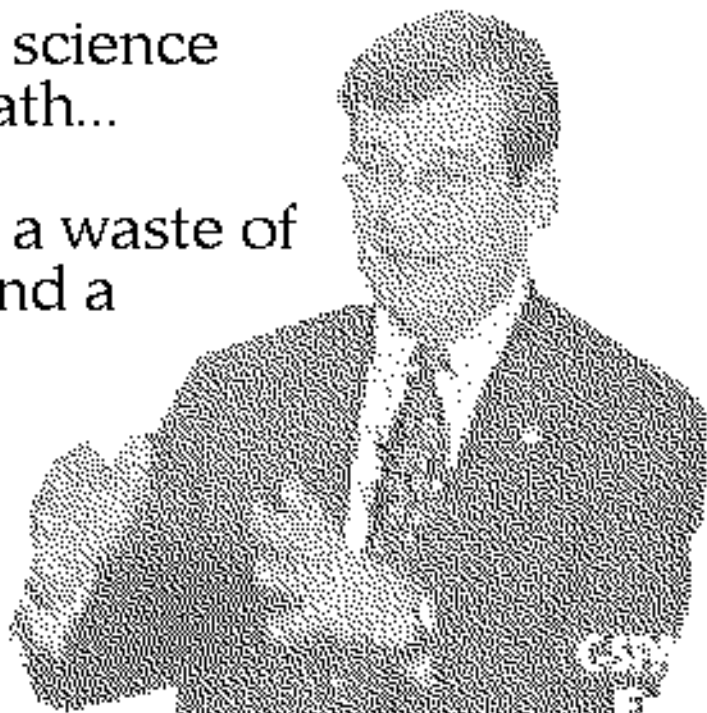


FRUSTRATION

“I took four years of science
and four years of math...

A waste of my time, a waste of
the teacher's time, and a
waste of space...

You know, I took
physics. For *what?*”



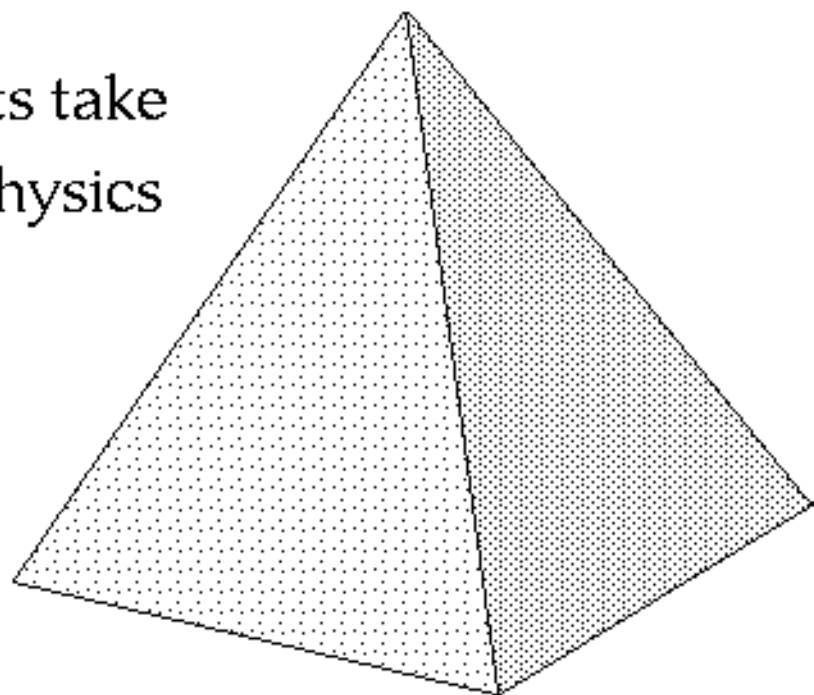
FRUSTRATION



- ➊ Some problems...
- ➋ Some more problems...
- ➌ Challenges

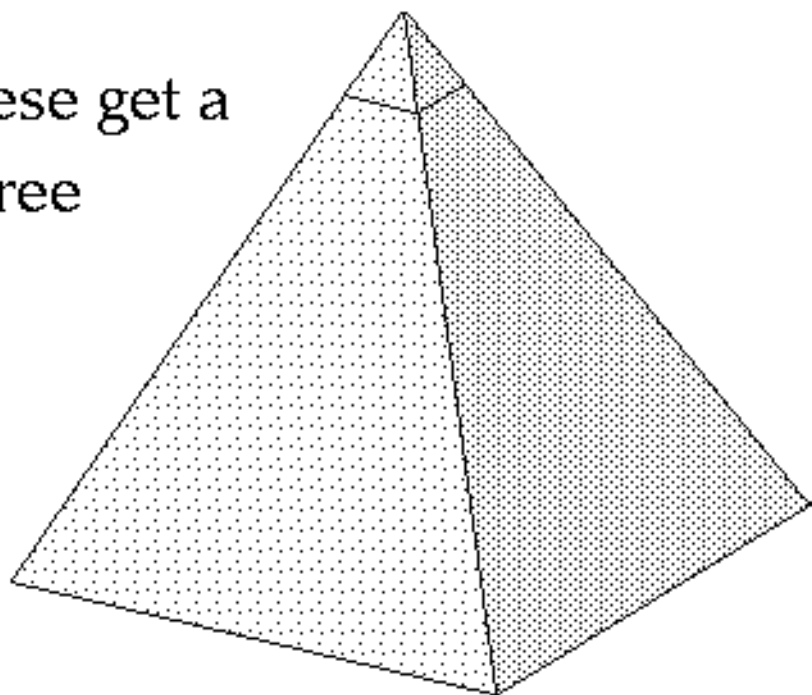
PHYSICS EDUCATION

380,000 students take
introductory physics
each year...



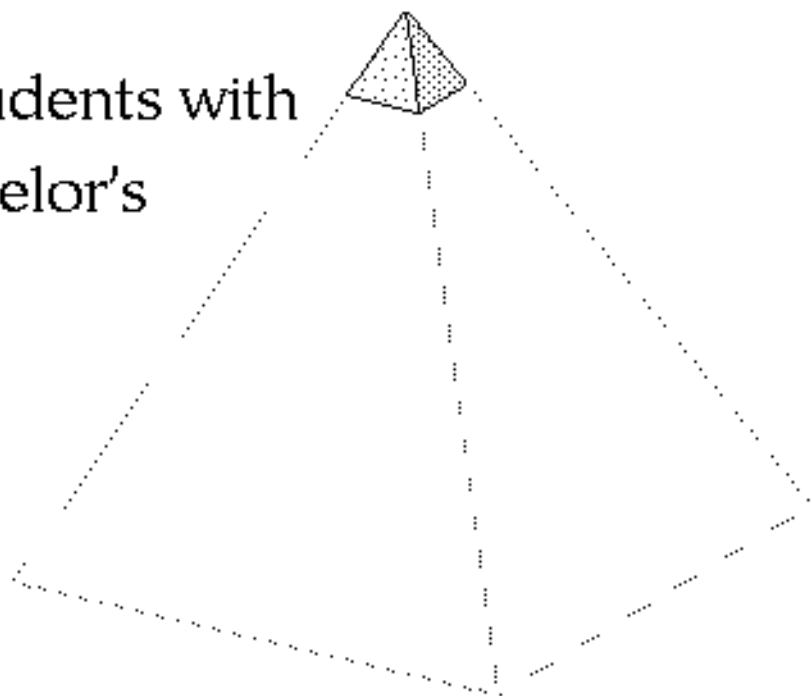
PHYSICS EDUCATION

about 1% of these get a
bachelor's degree
in physics.



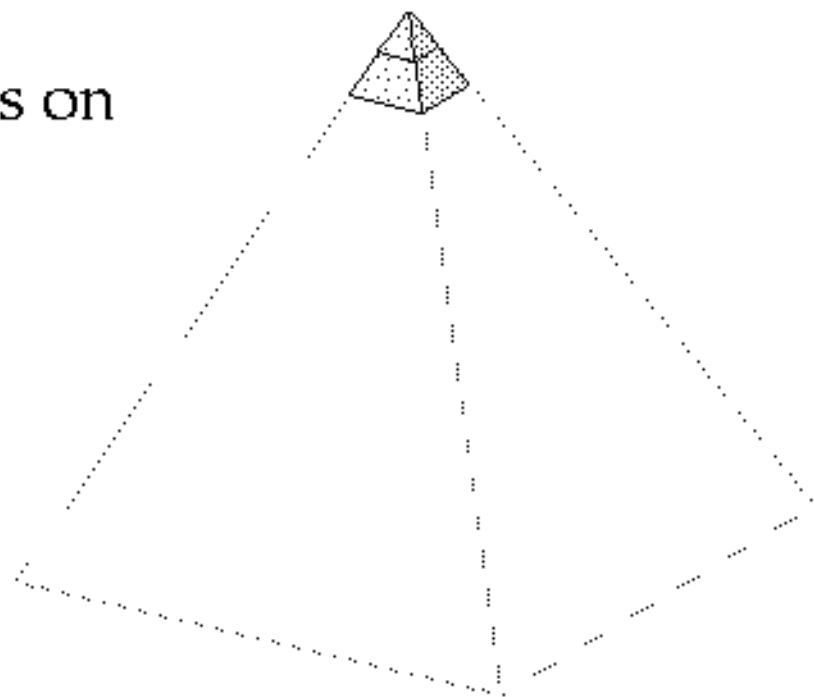
PHYSICS EDUCATION

Of the 4,300 students with
a physics bachelor's
degree...



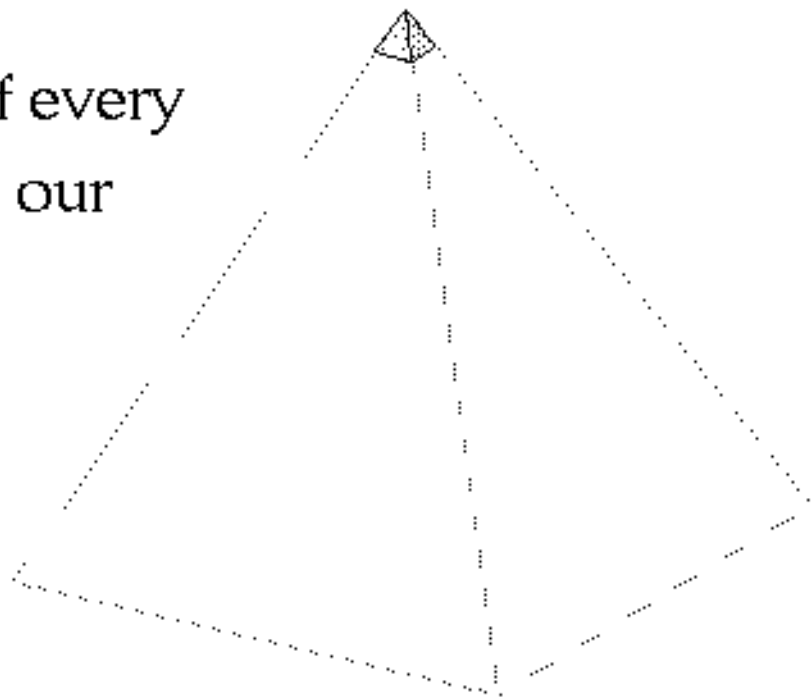
PHYSICS EDUCATION

about 35% goes on
to get a Ph.D...



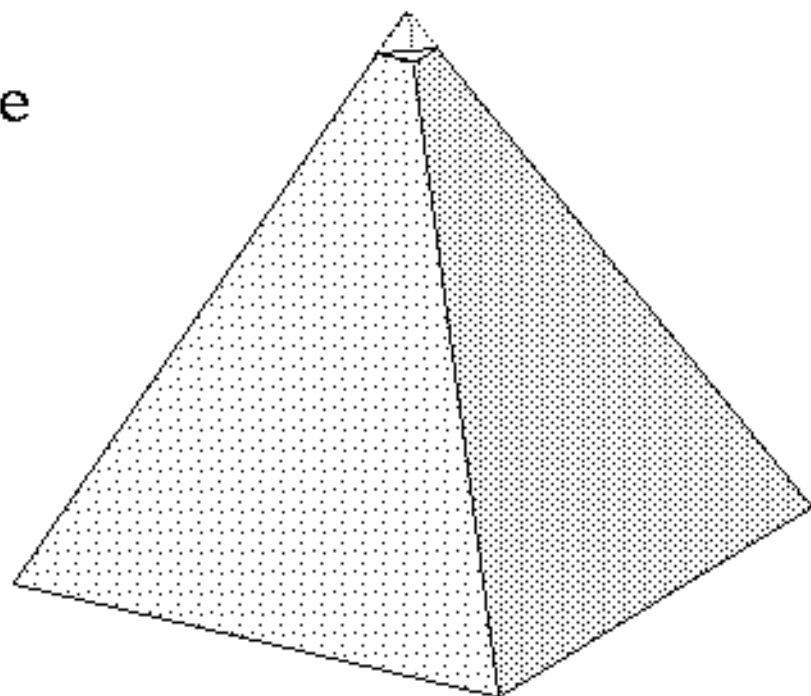
PHYSICS EDUCATION

That's 1 out of every
260 students in our
introductory
courses!



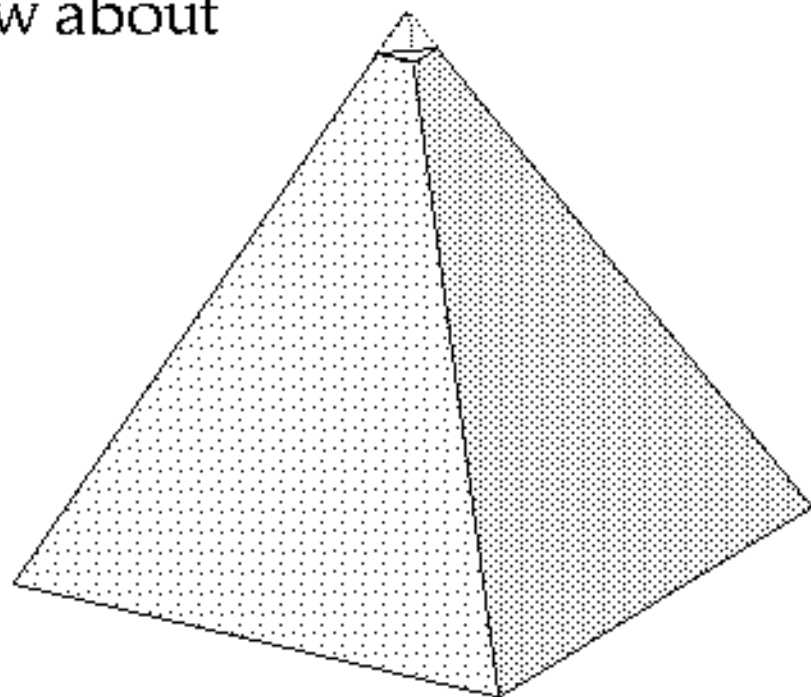
PHYSICS EDUCATION

What about the
other 259...?



PHYSICS EDUCATION

What do we know about
these students?



IGNORANCE



ATTITUDE PROBLEM?



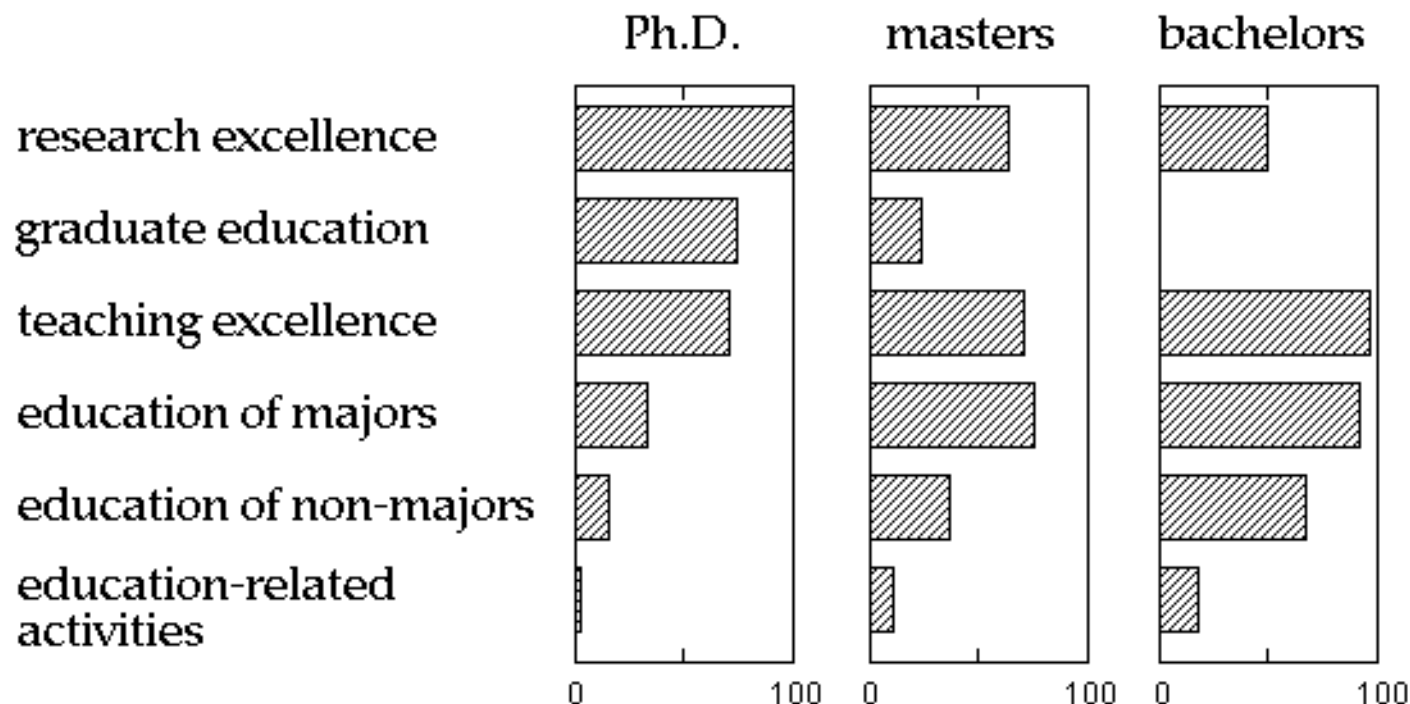
ATTITUDE PROBLEM?

“What are our most important objectives?”

- excellence in research
- excellence in teaching
- education of graduate students
- education of undergraduates
- education of non-majors
- education-related activities



ATTITUDE PROBLEM!



- ➊ Some problems...
- ➋ Some more problems...
- ➌ Challenges

BARRIERS

“reform”: bad word!

scepticism

initial effect

mismatches



POINTS TO CONSIDER

- evaluate
- reach out to public
- don't (re)invent; *implement!*
- involve research community



Acknowledgments

Catherine Crouch (Harvard)
Phil Sadler (Harvard)
Tim Bozik (Prentice Hall)
Alison Reeves (Prentice Hall)

© 1997 Eric Mazur

<http://mazur-www.harvard.edu>

<http://galileo.harvard.edu>



Thank you!