



The IGERT Experience

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TOPICS

- Science of the future - TODAY
- IGERT Program
- IGERT at the NSF
- Summary

Why Interdisciplinary Research?



"I'm on the verge of a major breakthrough, but I'm also at that point where chemistry leaves off and physics begins, so I'll have to drop the whole thing."

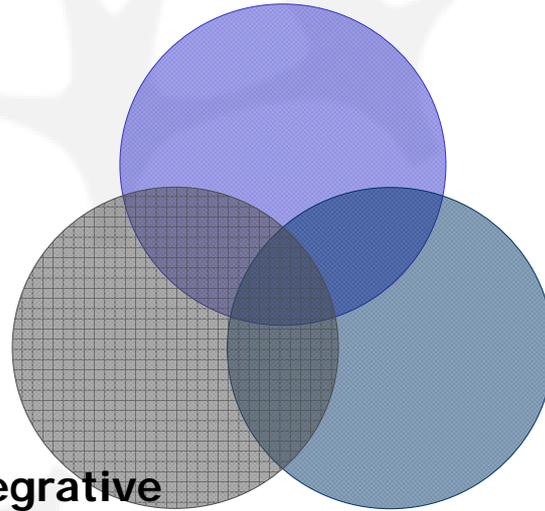
COSEPUP Report 1995

Reshaping the Graduate Education of Scientists and Engineers

- Produce more versatile scientists and engineers
 - A greater range of academic options
 - Greater training in a variety of career skills
 - Avoid compromising
 - Local option
 - Excellence in research
 - Time to degree
 - Broader participation

Science of the Future

Interdisciplinary

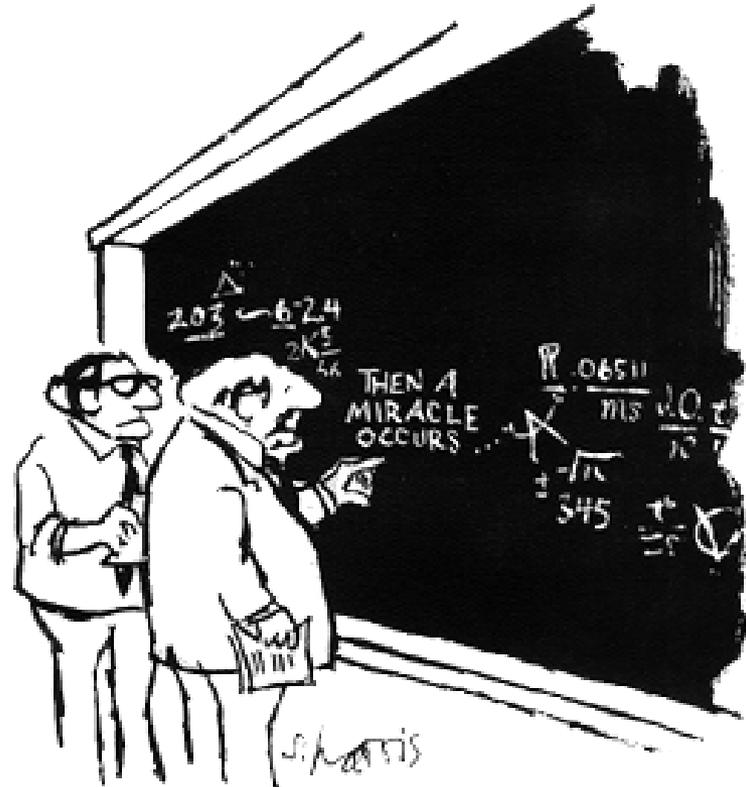


Collaborative and Integrative

Global

The Collaborative Global Scientist - Communicator

- How do scientists and engineers learn science and technology?
- How do scientists learn about collaboration and communication – to all audiences?
- How does graduate education, research and training fit into this equation?



"I think you should be more explicit here in step two."

IGERT – Integrating Research and Education into an overall Training Experience

- Interdisciplinary theme plus disciplinary depth
- Emerging, cutting-edge interdisciplinary research area
- Quality and Innovation in planned graduate education
- Catalyze a cultural change in graduate education
 - For graduate students
 - For faculty
 - For institutions

Additional Program Elements

➤ Trainee

- **Broadening participation**
- Career development opportunities
- International activities

➤ Project

- Assessment
- Administrative plan
- Institutional commitment

Science of the Future

➤ More interdisciplinary

- Work across disciplines
 - Cross-disciplinary advisory committees
 - Lab rotations
 - Out-of-discipline lab requirement
 - Interdisciplinary curriculum in which *all* gain skills
 - Experiences outside the university setting

Science of the Future

- More collaborative and integrative
 - Teamwork
 - Collaborative projects and educational experiences
 - Graduate student team projects
 - Teamwork exercises
 - Retreats
 - “boot camps”

Science of the Future

➤ More global

- Global mindset
 - Research collaborations
 - Summer institutes or short courses
 - Internships abroad
 - Fieldwork
 - Career options

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The History of IGERT

- First awards made in 1998
- 195 total awards, including 40 states and DC
 - 16 EPSCoR states
- Topics cross the entire range of science and engineering disciplines at NSF
- New cohort to be awarded in FY 2008

Characteristics of IGERT Awards

- 5-year duration
- ~ \$3 M total funding
- ~12 trainees/year/award
- For each IGERT doctoral student:
 - \$30,000/year stipend
 - \$10,500 cost of education
 - Travel and expenses

Risky and Worthwhile Business

- IGERT: innovation is a requirement and Innovative science or new educational models may mean risk
 - Risk to the progress of the doctoral student is not acceptable

Challenges for Students

- Coping with an interdisciplinary curriculum with disciplinary depth
- Having a critical mass and support group
- Role models
- Career if want position in traditional academic discipline

Challenges for Faculty

- Departmental requirements
- Cultural differences among departments
- Administrative load on PI, faculty
- Release time or credit for faculty teaching
- Recognition for interdisciplinary teaching at (tenure or) promotion

Challenges for Institutions

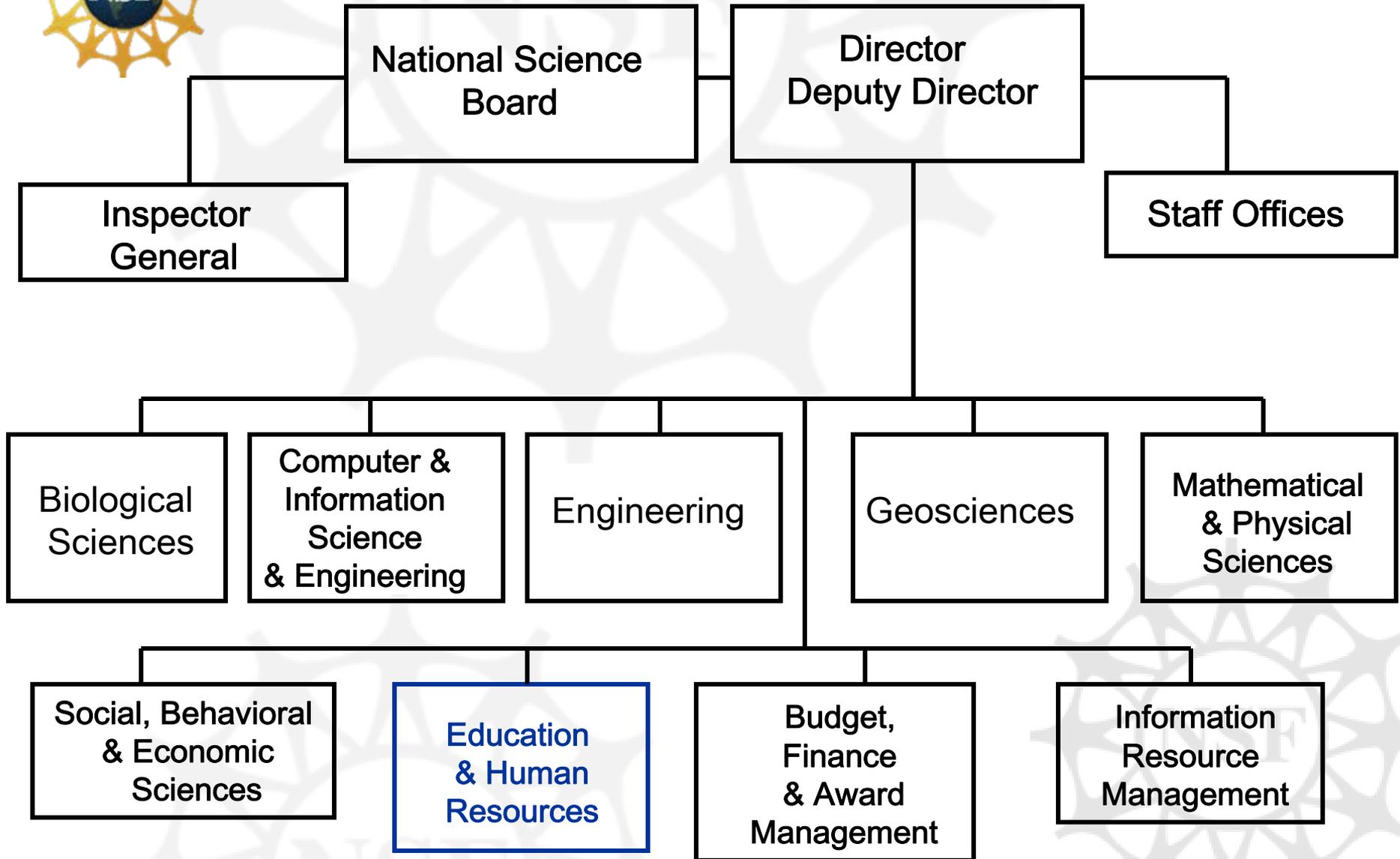
- Rewarding interdisciplinary graduate education by faculty
- Hiring new faculty outside traditional disciplines
- Rewarding interdisciplinary research by young faculty
- Overcoming resistance or inertia

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National Science Foundation



IGERT 2-Stage Annual Review Process

- Preliminary proposal
 - Interdisciplinary Panel review
 - ICC recommendations, DGE invitations
 - FY 2007 ~450 preliminary proposals
- Invited full proposal
 - Interdisciplinary Panel review
 - ICC recommendations, DGE recommends awards
 - FY 2007, 98 full proposals
- Awards to be made for FY 2007
 - Between 15 to 20, including 6 renewals
 - ~5% success rate

Reviewers/Panelists

- Importance of orientation of panelists
- Selection of panelists
 - IGERT PIs and IGERT faculty
 - Previous IGERT panelists
 - New IGERT panelists (non-IGERT awardees)

IGERT Evaluation Study Initial Impacts

- First three cohorts (1998-2000)
- Both IGERT and non-IGERT samples
 - Graduate Students
 - Faculty
 - Administrators

TOPICS

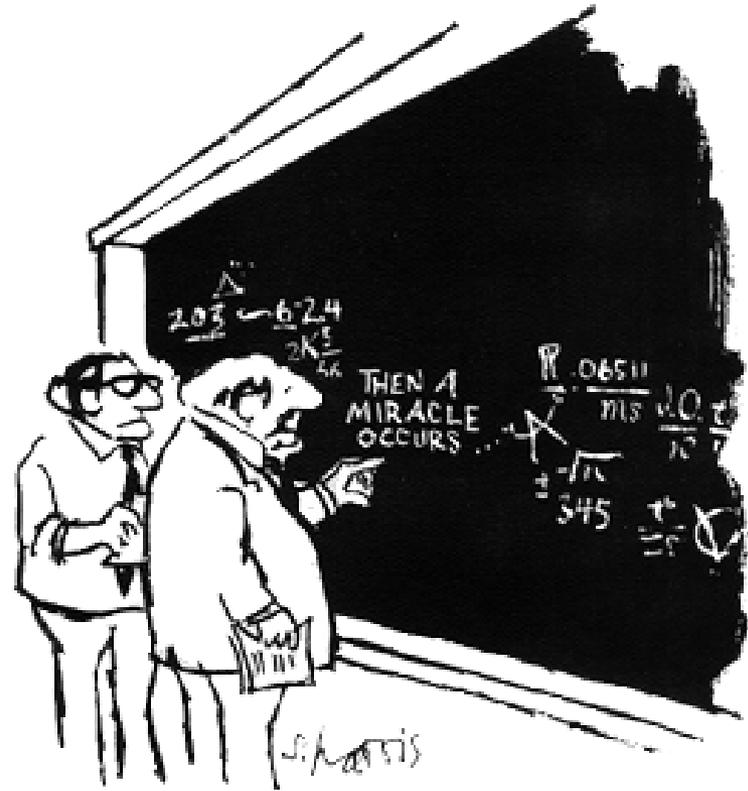
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Conclusions

- Graduate education can be designed to be:
 - More interdisciplinary
 - More collaborative
 - More global
 - Oriented toward preparation of a variety of careers
- Trainees, Faculty and institutions *all* benefit

Conclusions

- YOUR challenge is to capture all of this into 25 pages... with "only a few" miracles!



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