A (personal) perspective of the

University Program

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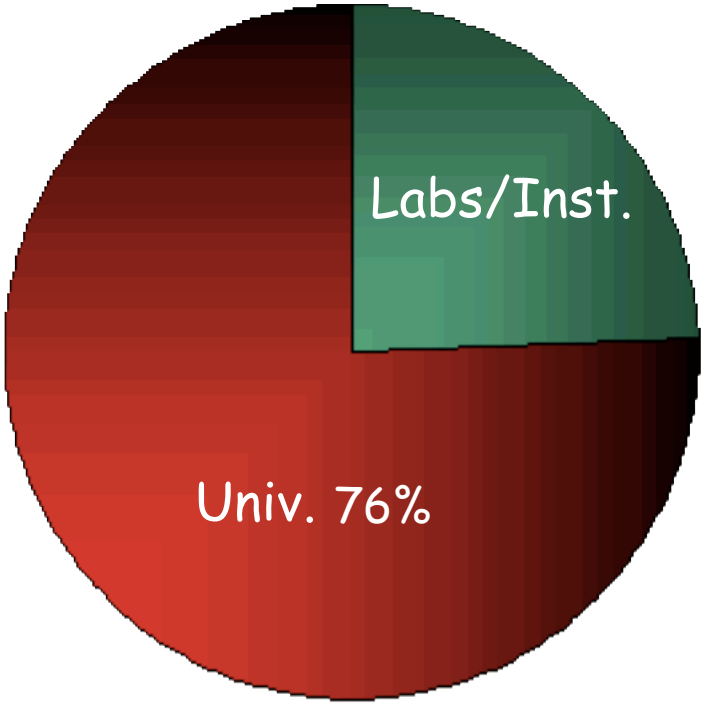
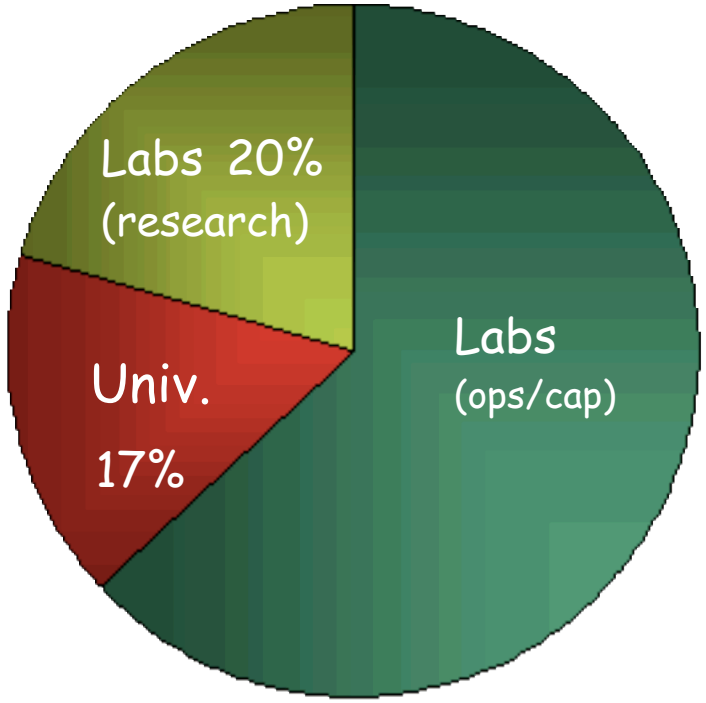
2002 HEP

4020 Personnel

(not including technical etc.)



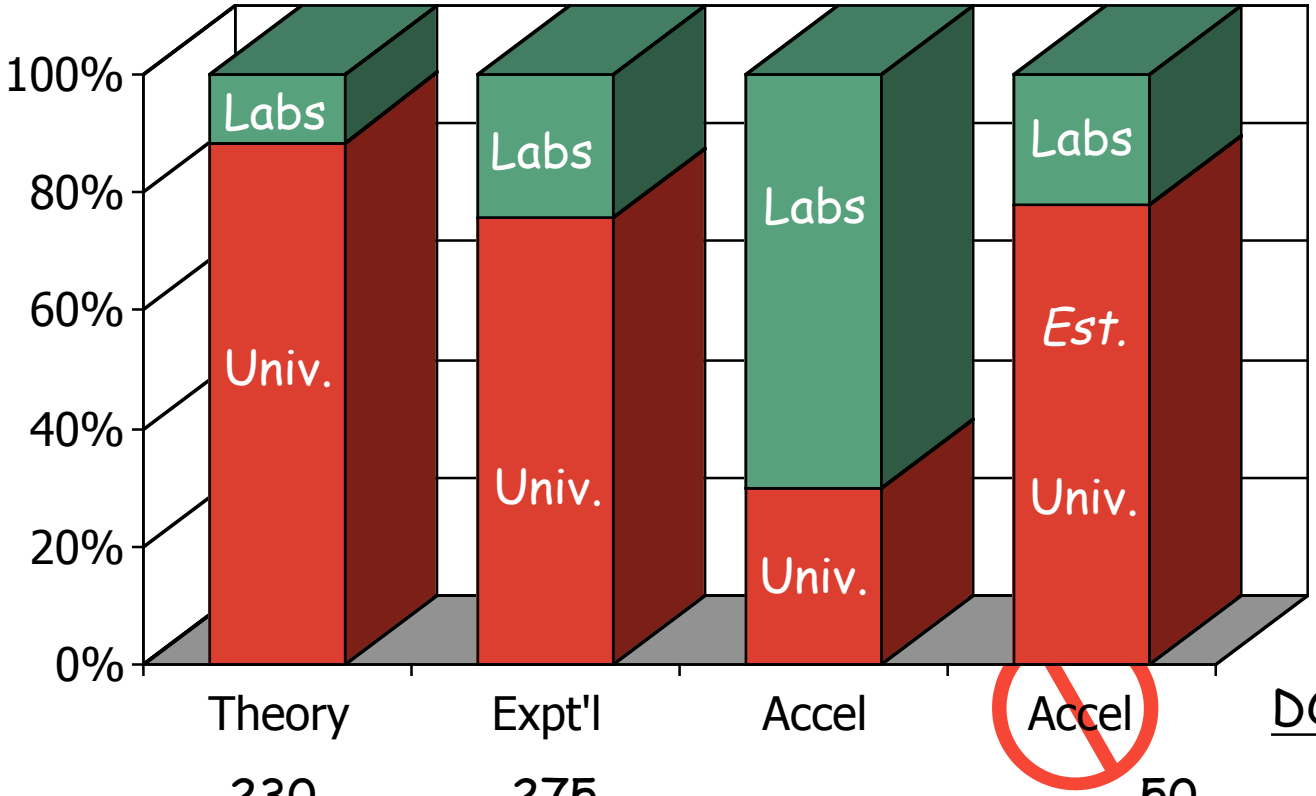
698 M$ Budget



105 Universities and 239 Groups (DOE grants)

University Component

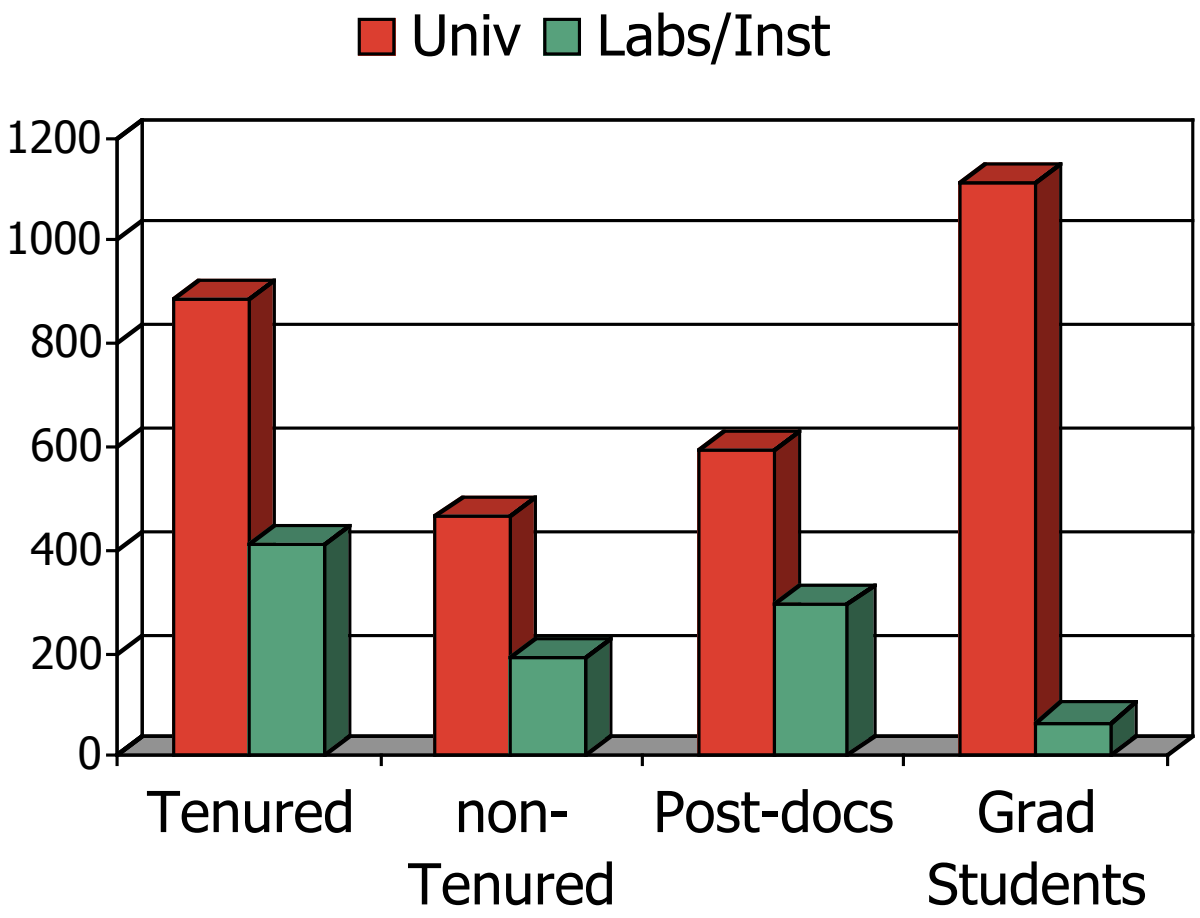
DOE GROUPS 73 127 36



All groups

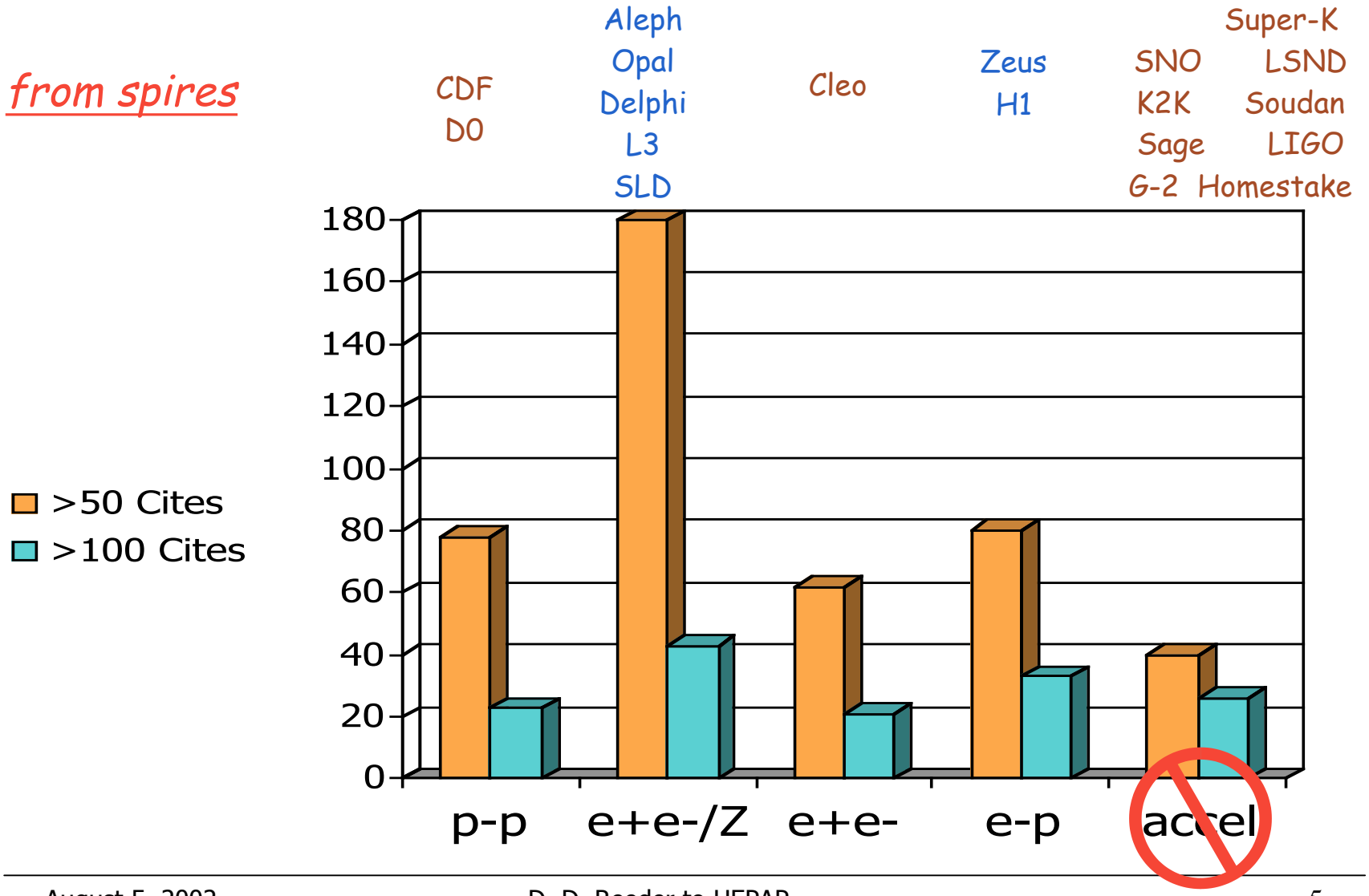
DOE-funded				
Faculty	230	275		50
Post-docs	125	255		45
Students	140	330		40

HEP types


Univ
Labs/Inst
1200
1000
800
600
400
200
0
Tenured
non-Tenured
Post-docs
Grad Students

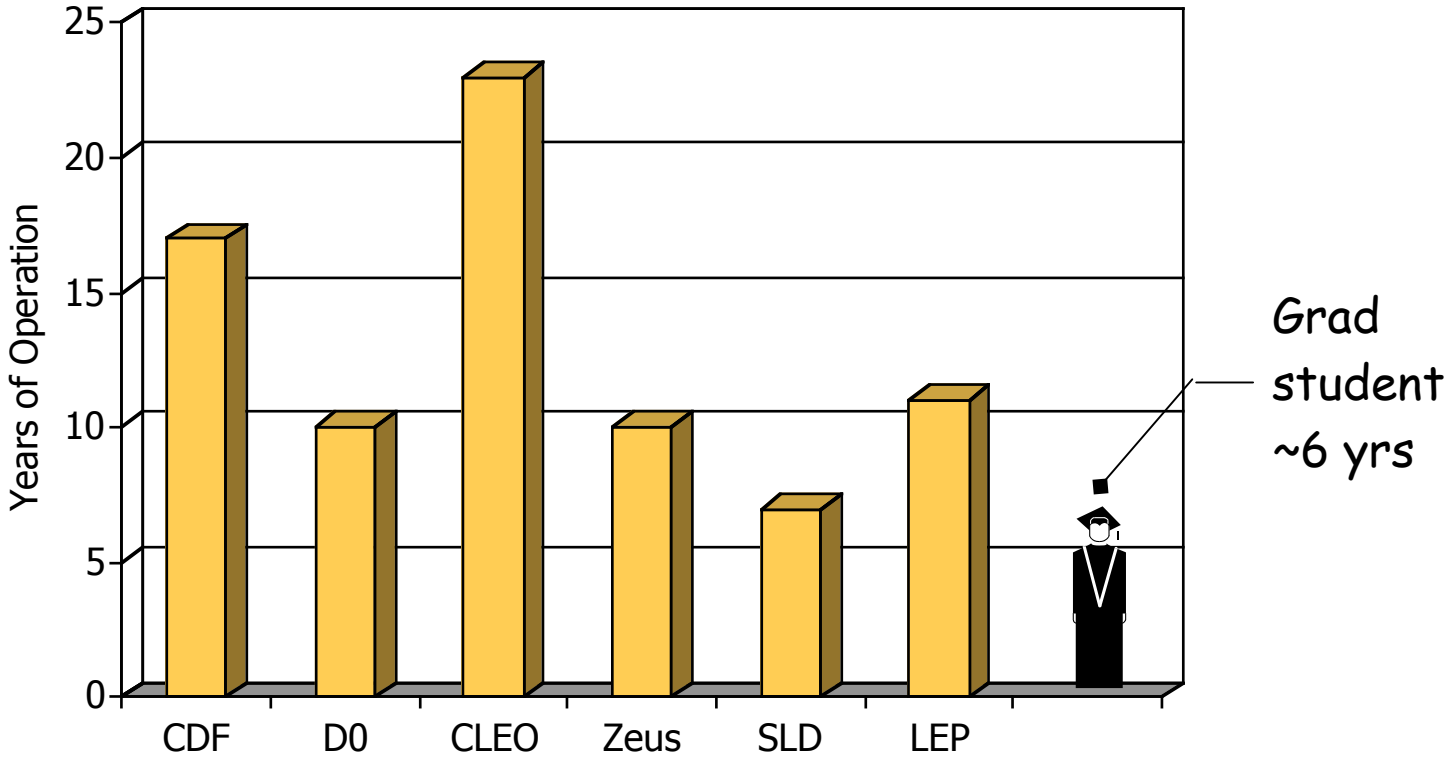
Productivity

from spires



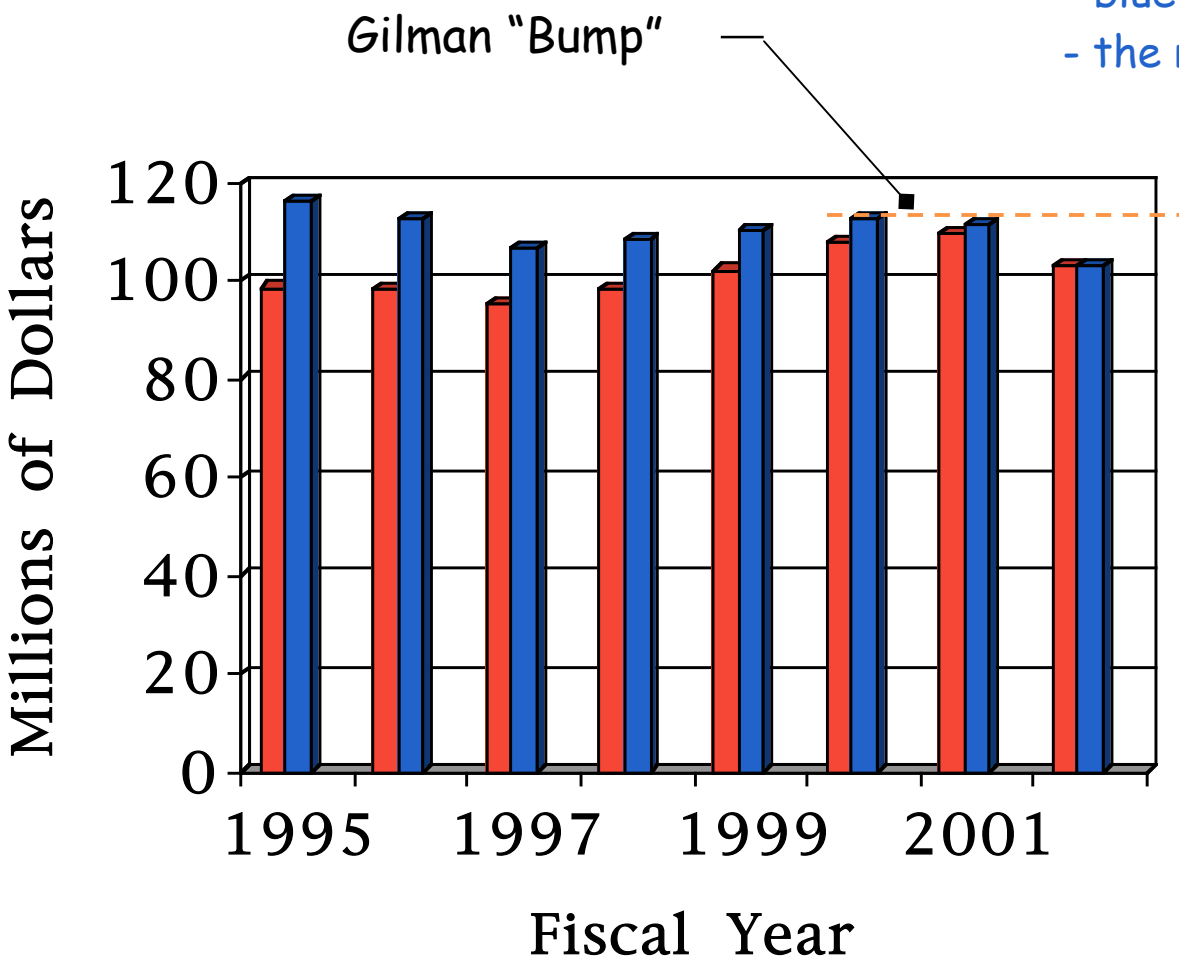
Longevity

Experiments are so long that a student sees only a small part (usually analysis)



University Funding

- blue is corrected to 2002 $
- the red is "then year" $.

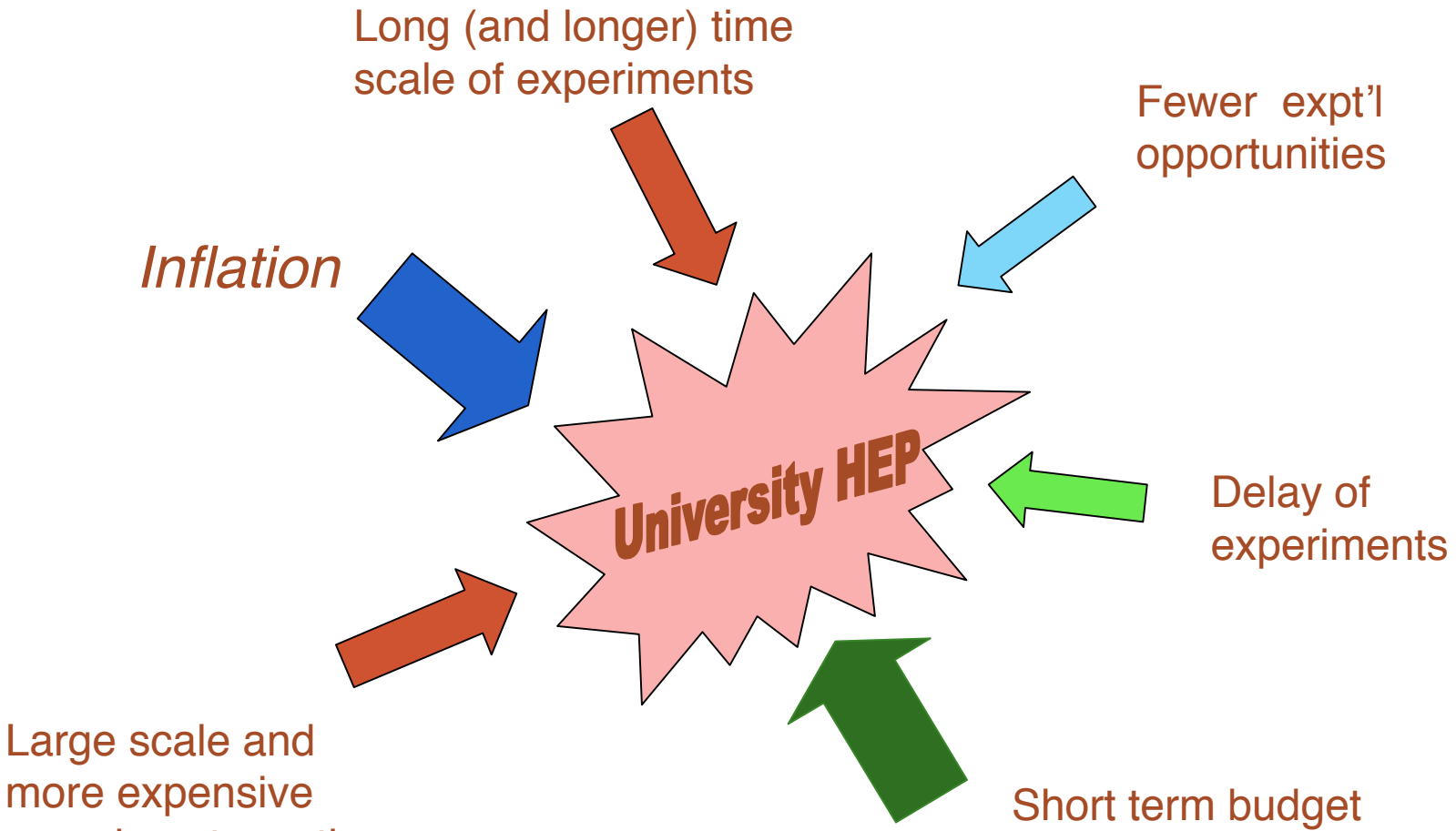


Constant level of effort

Because the typical grant 75% salaries,

inflation ~3-4%

The Squeeze


Long (and longer) time scale of experiments
Fewer expt'l opportunities
Inflation
University HEP
Delay of experiments
Large scale and more expensive experiments up the ante for entry.
Short term budget fluctuations

Infrastructure

- 1997 PDF Survey indicated that <9% of the HEP manpower (FTE) were engineers and technicians. Erosion has continued!?

Coping mechanisms:

1.) University subsidies to mechanical shops etc.

2.) Commercial mfg. or hire limited term help

3.) Shift of engineering and technicians to project-colored money (e.g. LHC)

4.) Stay out of projects or activities that require engineers or technicians. (Software etc. included)

Effect of the reduction is to inhibit broadening. Groups must reprise their collaborative effort both to effectively employ the remaining staff and to credibly propose a technical contribution.

Management Dilemmas

- Keep staffing levels unchanged

But…since 75% is in salaries, this 10% cut translates into a reduction of travel, equipment *etc.* **>40%!**

- Reduce staff

The commitment to personnel is typically multi-year so it is difficult to implement an across the board cut.
Exception: the component most easily reduced is # of students. But this is costly in talent and morale.

- Shrink program scope

Loss of opportunity, diversity
Failure to fully exploit capital investment

P5 Challenge

High Priority (exploit existing US facilities)

BaBar, CDF, D0

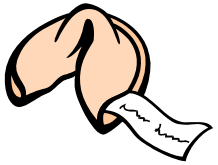
Intermediate priority (access the high energy frontier)

LHC (CMS, Atlas)

Other opportunities

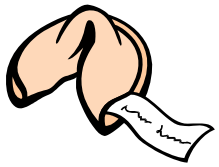
Symmetric e+e- colliders	e-p collider	IceCube
Rare K decays	SNO	Super K
KamLAND	CDMS	Milagro
MiniBOONE	AMS	Underground Lab
Minos	G-2	SNAP
BTeV	GLAST	Detector R&D
		Muon collider R&D

Trends? - Challenges?



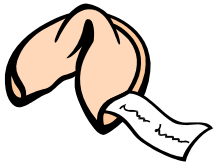
Loss of infrastructure

move to smaller projects;
- non-accelerator
- astroparticle
- smaller experiments



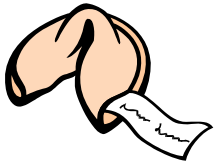
Timescale, scope increase

- less attractive for junior faculty
- incomplete training of grad students



Push to margin:

- Theory give more "bang for the buck"
- Experiments < scope for leadership.



Loss to program:

Universities are needed for R&D on;
- NLC
- Muon collider
- VLHC