NSF Physics Perspective

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- **Principles**
- **Division of Physics**
- **Recent Developments**
- **HEP Long-Range Planning**

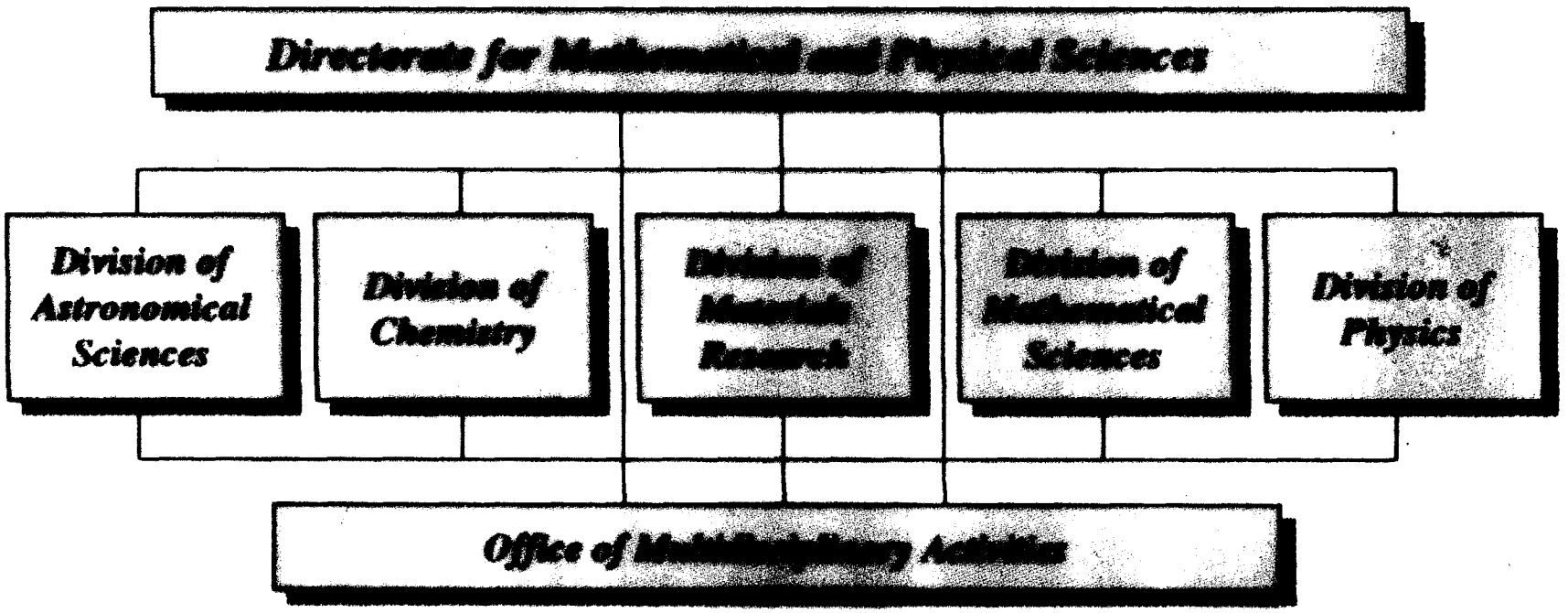
AN IRREDUCIBLE SET OF GUIDING PRINCIPLES

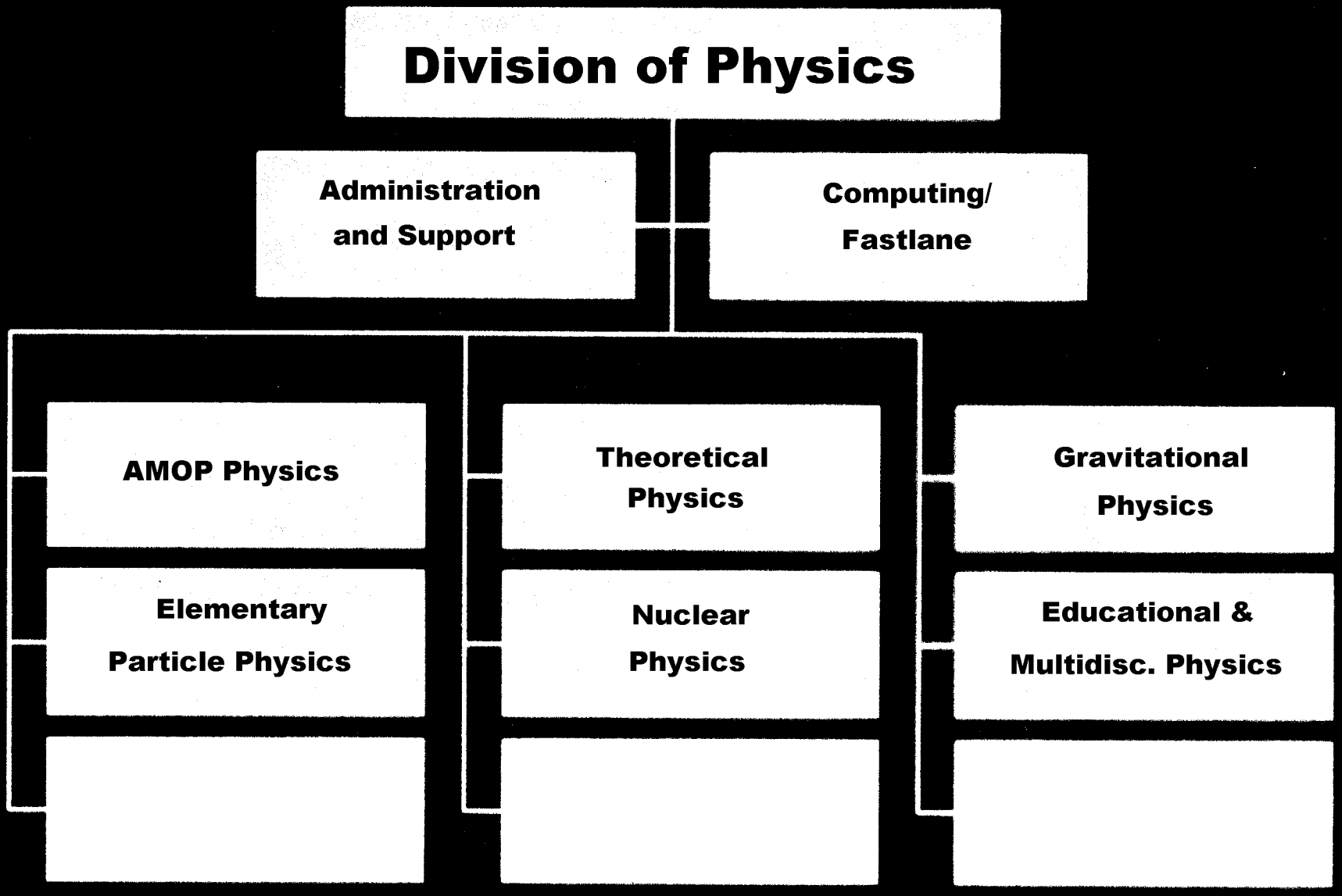
- Intellectual Frontiers
- Connections
- Education
- Stewardship

Ongoing and Potential Advances in Physics

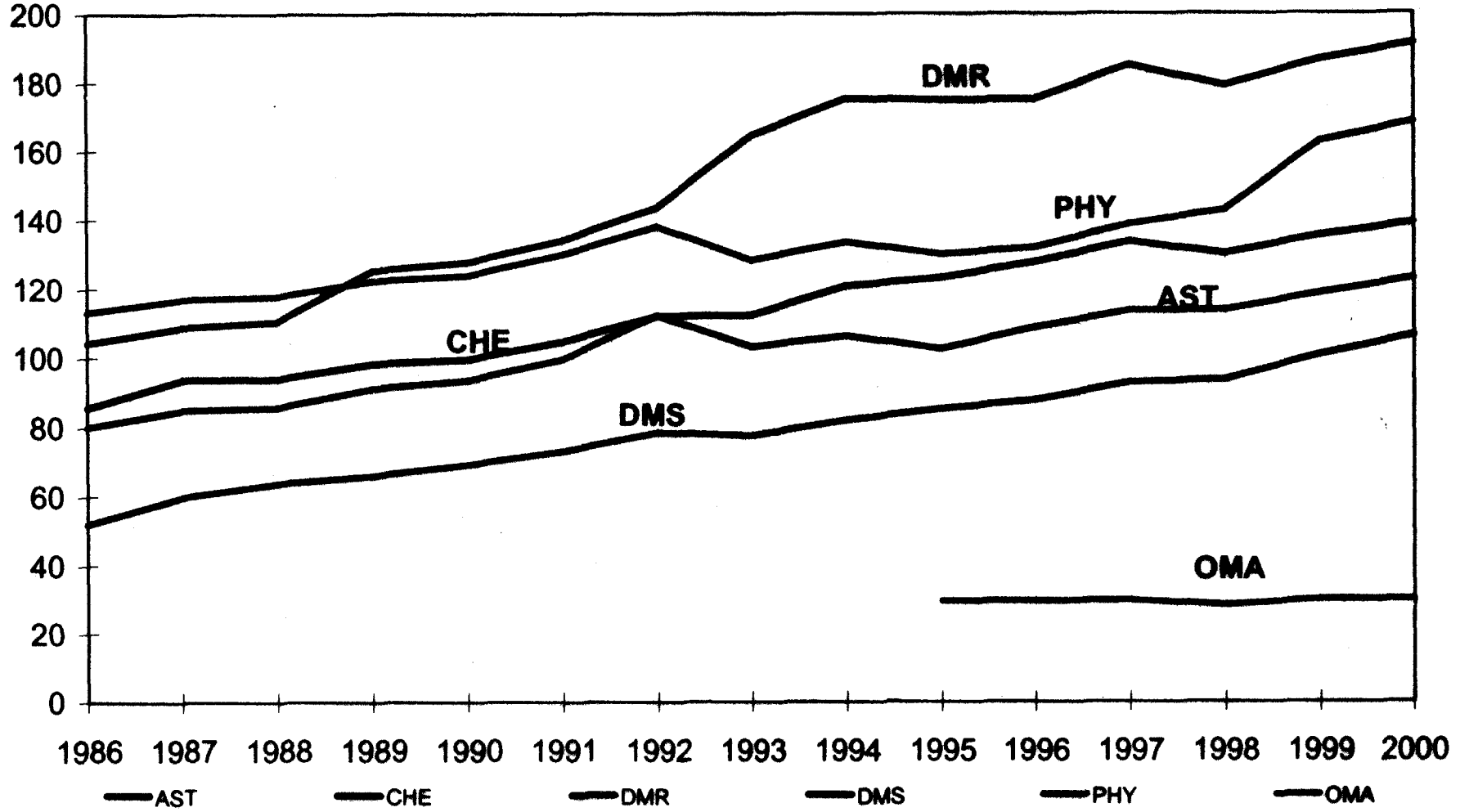
- Bose-Einstein Condensates in Gases
- Matter-Wave Optics and Atom "Lasers"
- Strings, Branes, Duality, Unification
- Higgs, mass, SUSY, Technicolor, CP violation
- Gravity Waves, Quantum Gravity
- Origin of Proton Spin, Quark-Gluon Plasma
- Quantum Information Science
- Dark Matter, Cosmic Rays, Cosmology

S Structure


Directorate for Mathematical and Physical Sciences
Division of Astronomical Sciences
Division of Chemistry
Division of Materials Research
Division of Mathematical Sciences
Division of Physics
Office of Multidisciplinary Activities


Division of Physics
Administration and Support
Computing/ Fastlane
AMOP Physics
Elementary Particle Physics
Theoretical Physics
Nuclear Physics
Gravitational Physics
Educational & Multidisc. Physics

MPS Divisional Budgets, 1986-2000 Current Plan
(Dollars in Millions)



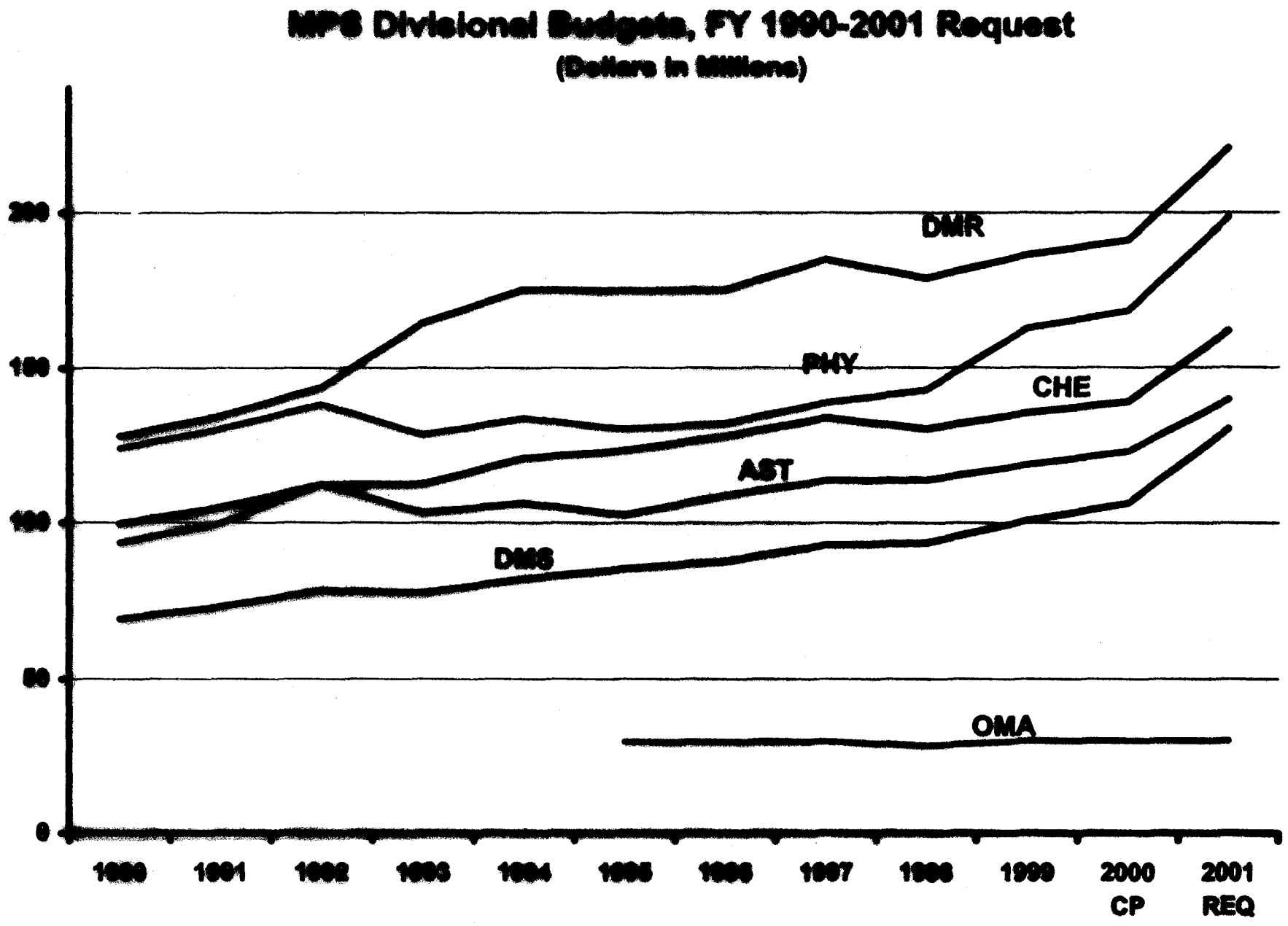
Excludes construction funds for NHMFL ($28.4 M, 1990-92), GBT ($69.5 M, 1991), Gemini ($88.0 M, 1991-95), LIGO ($246.5 M, 1991-97), and the LHC ($22M in 1999 and $15.9 M in 2000).

FY 01 President's Budget

	FY 1999 Actual	FY 2000 Current Plan	FY 2001 Request	Change Amount	Change Percent
Physics Research Project Support	99.58	106.72	142.77	36.05	33.78%
Facilities	63.16	61.63	55.88	(5.75)	-9.33%
TOTAL, PHY	162.74	168.35	198.65	30.3	18.00%

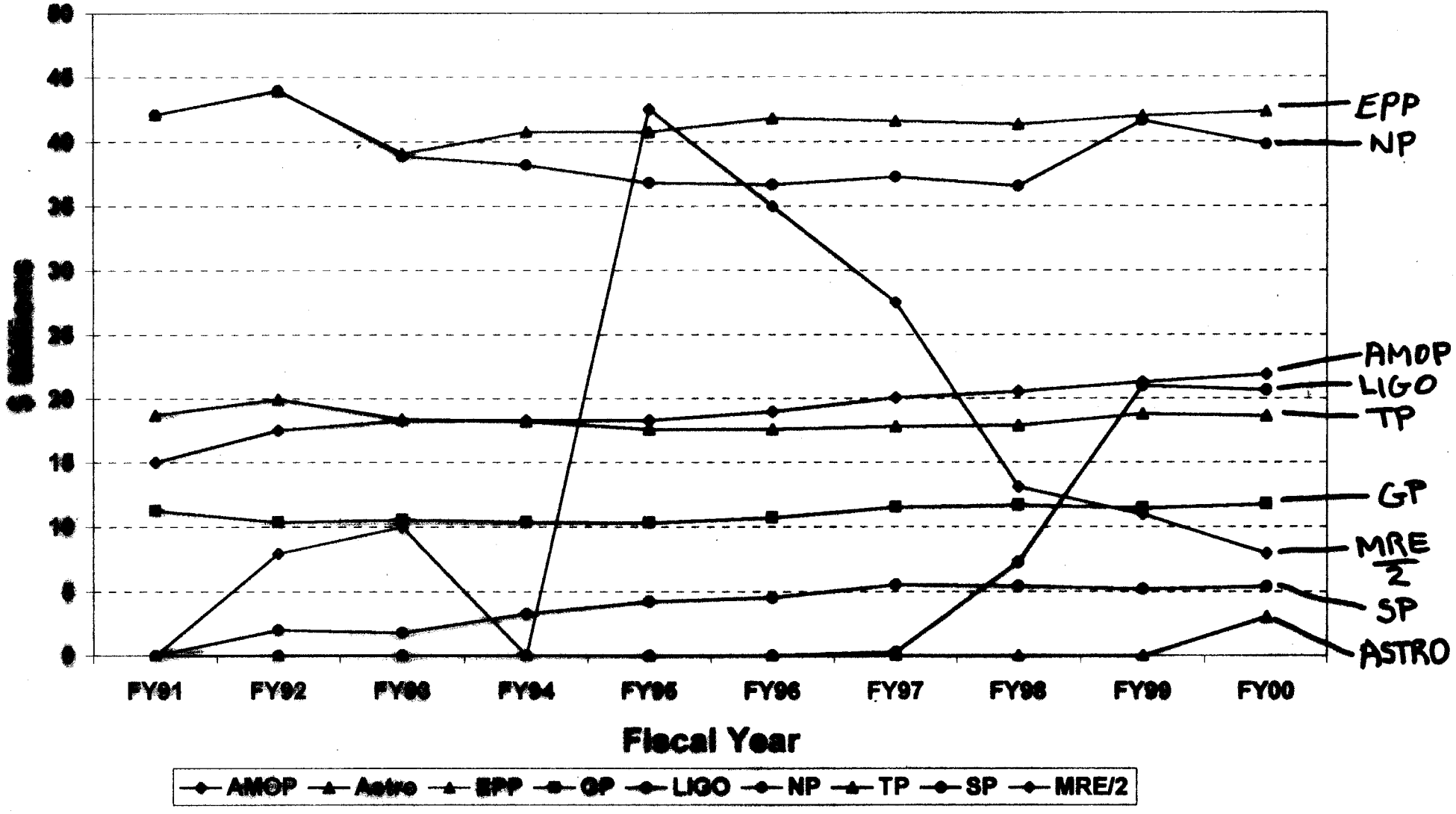
MPS Divisional Budgets, FY 1990-2001 Request

(Dollars in Millions)



Excludes construction funds for NHMFL ($28.4 M, 1990-92), GBT ($59.5 M, 1991), Gemini ($92 M, 1991-96), LIGO ($246.5 M, 1991-97), and the LHC ($84.3 M, 1990-2001 Req.).

Physics Programs FY91-FY00



EPP BUDGET UPDATE

• Accelerator-based	16.225
• CESR/CLEO	19.500
• Accelerator R&D	1.175
• Astrophysics	9.784
• Quarknet/Aspire/CROP	2.300
• Auger	0.938
• MRI (Utah-Chicago, Veritas)	0.906
• CAREER	0.500
• Theory	9.000
• TOTAL (not including $15.90M LHC const.)	$60M

RECENT DEVELOPMENTS

- Major Research Equipment (MRE)
  - RSVP ('02 candidate)
  - ICECUBE ('02 candidate)
- Major Research Instrumentation (MRI)
  - Veritas ($906K)
  - Others in nuclear (2), AMOP, gravity
- Information Technology Research (ITR)
  - GriPhyN

PROGRAMS TO WATCH

- Information Technology Research (ITR)
- Nanoscale Science and Engineering (NSE)
- Major Research Equipment (MRE)
- Major Research Instrumentation (MRI)
- Physics Frontiers Centers (PFCs)
  - NSF 00-108, pre-proposal deadline 9-18-00
  - NEW in FY 2001
  - 3-5 awards in $0.5 to $4M/yr for 5 years
  - Intellectual frontiers of physics

HEP PARADOX

- Best of times
  - Discovery potential and excitement in HEP truly spectacular, never greater
  - Unprecedented prosperity and public support for science
- Worst of times? No, but.....
  - Downward pressure on budgets
  - Path ahead unclear, except for high costs for future facilities

Lykken Manifesto

- "Among the many crimes of the bourgeois overlords of HEP and their running dog lackeys is to have allowed the misapprehension among students (and the public) that particle physics is almost done....In fact high-energy physics is exciting and will remain exciting....." (New York Times, 6-20-00)

IT'S THE VISION, STUPID

- Driven by compelling science questions
- Broadened to include major approaches, e.g., energy frontier, luminosity frontier, astrophysics, theory
- Priority to existing discovery potential
- Community input and endorsement
- Stress educational and broad impacts
- Placed in an international context
- Coherently advanced