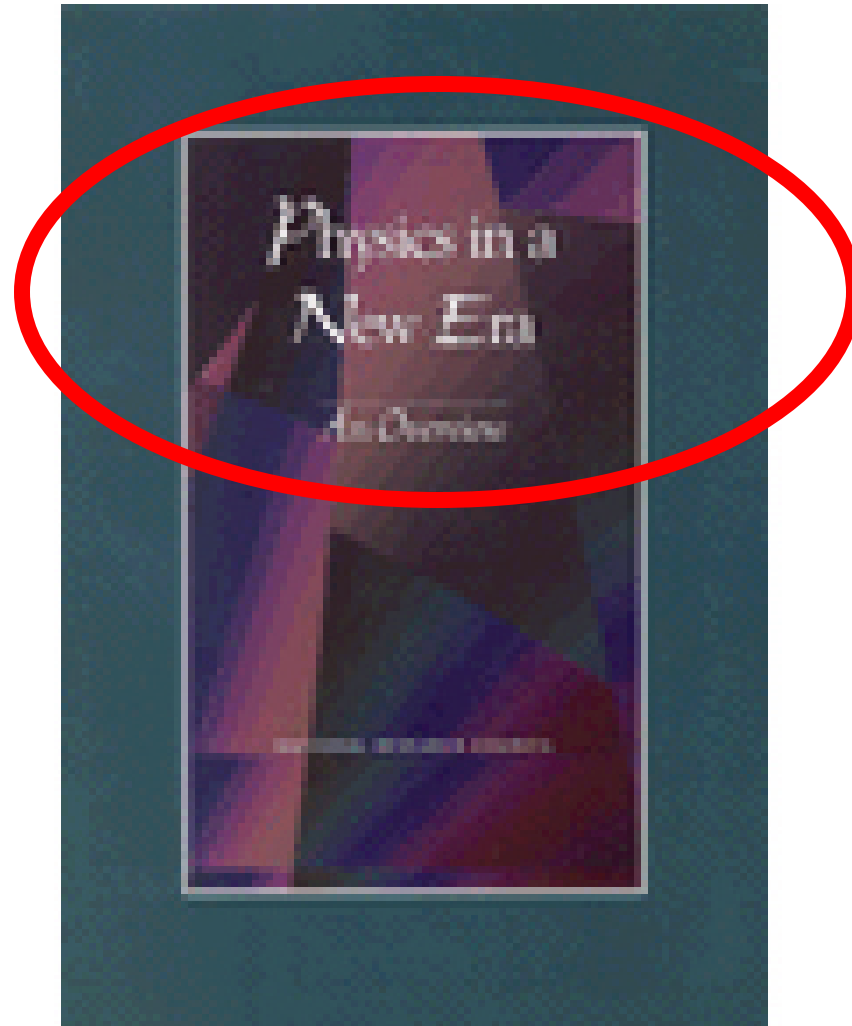


# **A Synoptic View of Physics**

Current Physics Survey Overview

BPA  
November 4-5, 2006

# The Previous Attempt



208 pages, 7 x 10, paperback (2001)

# The Previous Attempt

- *Atomic, Molecular, and Optical Science: An Investment in the Future* (1994)
- *Plasma Science: From Fundamental Research to Technological Applications* (1995)
- *Elementary-Particle Physics: Revealing the Secrets of Energy and Matter* (1998)
- *Nuclear Physics: The Core of Matter, the Fuel of Stars* (1999)
- *Condensed-Matter and Materials Physics: Basic Research for Tomorrow's Technology* (1999)
- *Gravitational Physics* (1999)
- *Physics in a New Era: An Overview* (2001)

# The Previous Attempt

- the growing power of its instruments, and its expanding reach into the other sciences have generated an unprecedented set of scientific opportunities
- Some coincide with the priorities set forth in the area volumes,<sup>1</sup> while others cut more broadly across the whole of physics, overlap other areas of science, or are of growing importance for technology.
- based on their intrinsic scientific importance, their potential for broad impact and application, and their promise for major progress

# The Previous Attempt

## Science Priorities

- Developing quantum technologies
- Understanding complex systems
- Applying physics to biology
- Creating new materials
- Exploring the universe
- Unifying the forces of nature



Numerical  
Modelling

# Previous Recommendations

- **Investing in Physics.** Develop a strategy for long-term investment in basic physics research; reestablish levels of early 80s.
- **Physics Education.** Educate the public; improve the physics curriculum to attract more students into the field.
- **Small Groups and Single Investigators.** Support those working at the cutting edge.
- **Large Facilities and International Collaborations.** Develop a vision of the future and engage international partners.
- **National Security.** Reestablish the high priority of long-term basic research in defense programs.
- **Partnerships.** Government, universities, and industry should encourage partnerships.
- **Federal Science Agencies.** Government should give broad support to core physics.
- **Peer review.** Make decisions about support for research on the basis of peer review.
- **Physics Information.** A coordinated approach should be developed for the support of bibliographic and experimental databases and data-mining tools.

# Physics 2010

- Impact of the *Physics in a New Era* overview
  - Soft. But Ehlers did convene his colleagues to listen.
  - Concerns of CMMP community
  - View of Richter that we don't need an overview of physics
- Planning for the next overview of *Physics 2010*
  - Finish the current series
    - Gravitational Physics (include cosmology? Cosmic-ray physics?)
    - Nuclear Physics
    - Others? Biological Physics? Cosmology?
  - Follow the new guidelines
    - Ask hard questions. Is physics any more than its parts?
    - Motivate physics... why is it an important part of the intellectual enterprise and why should public funds support it.
    - Clear priorities with definite actions to be taken by identified actors.
    - Engage outsiders... (the epp experience)
      - Scientists from other fields... biology, chemistry, mathematics
      - Policymakers experienced in decision process in Washington
      - Industry leaders
      - Can we find a credible advocate for the field who is not a physicist?