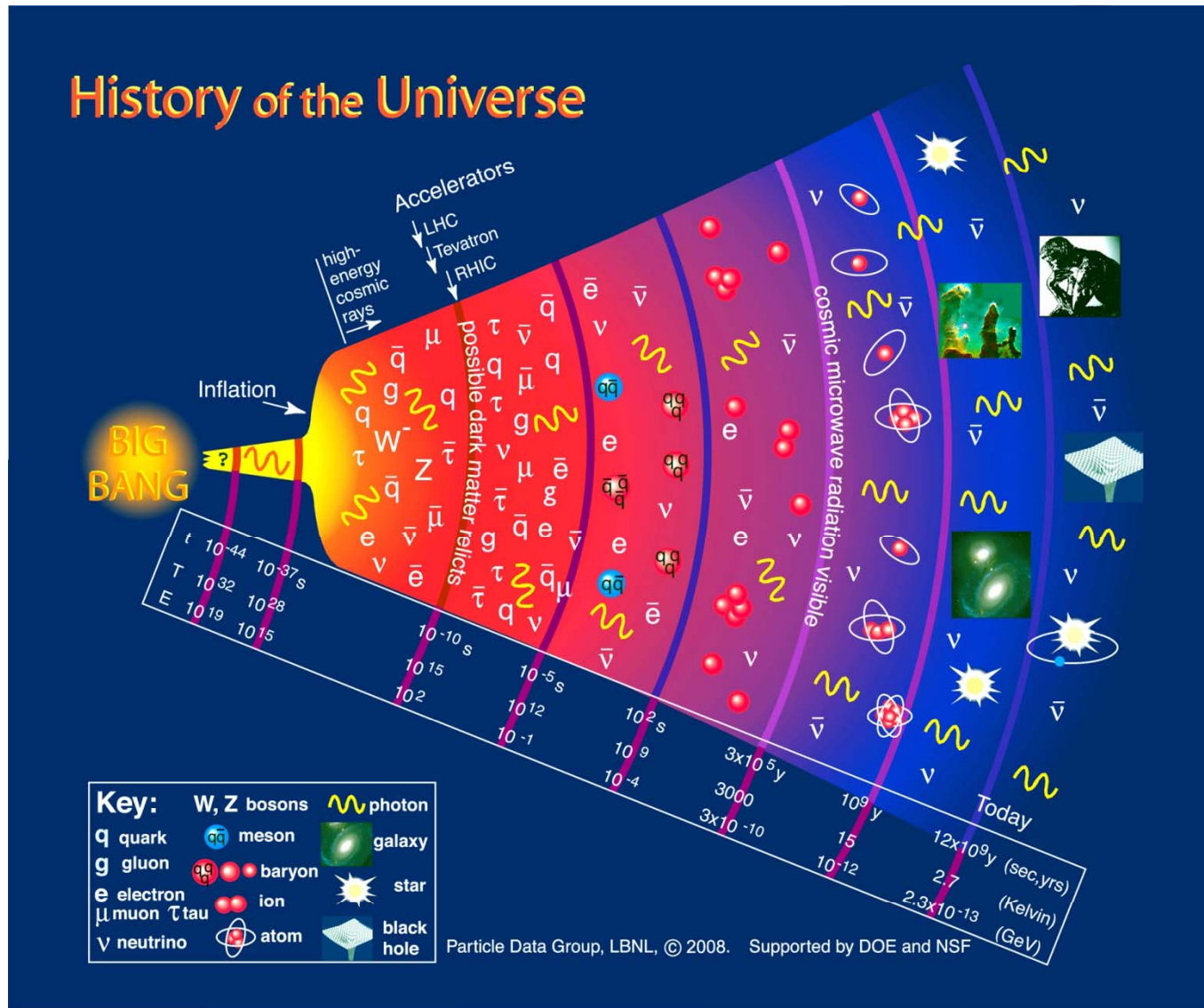
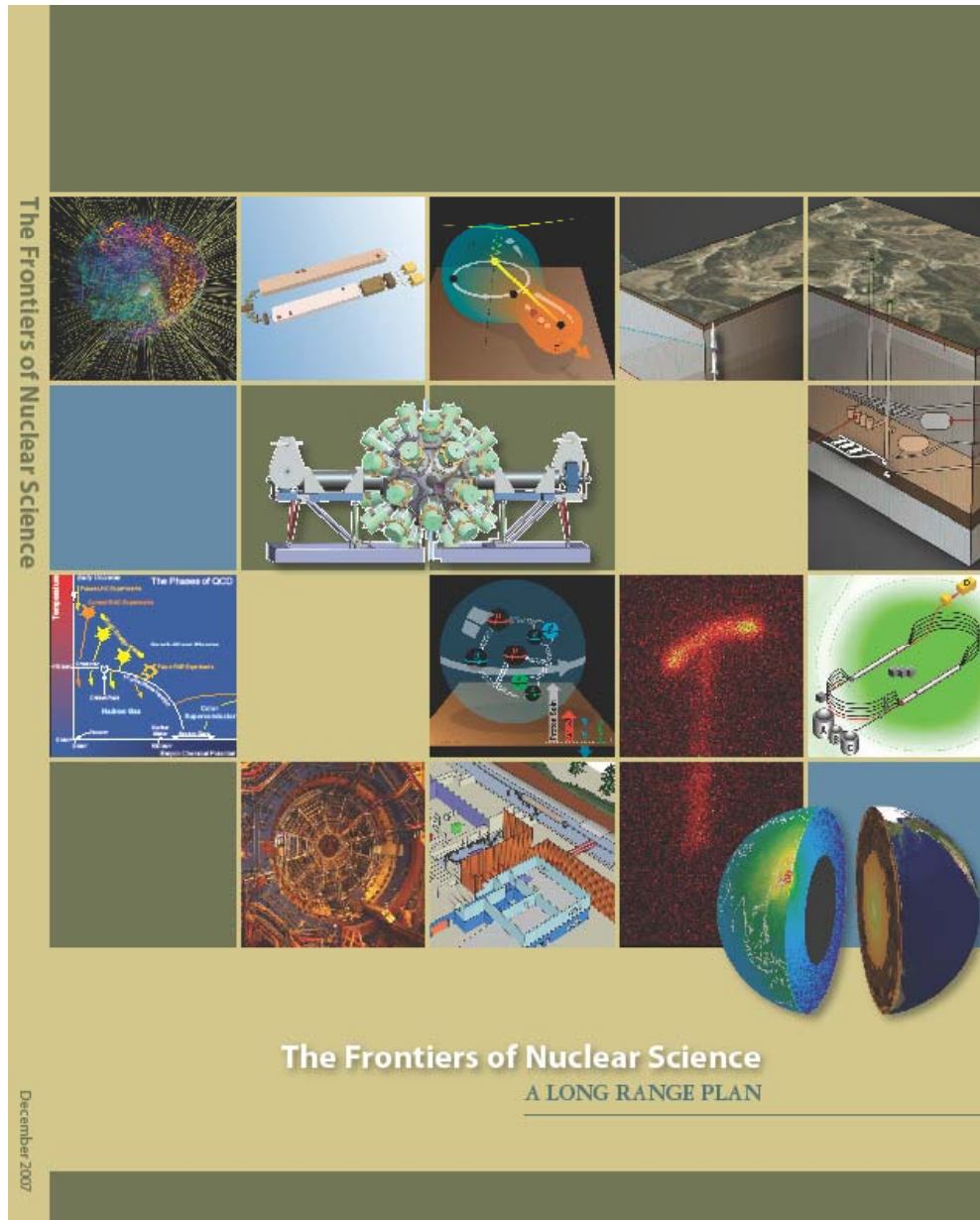


Nuclear Physics is an integral part of the history of the universe



- Quark – Hadron Phase Transition
- Properties of Hadrons
- Properties of Nuclei
- Energy production in stars
- How are the heavy elements produced
- Neutron stars and supernovae
- Neutrino, properties, T violation and tests of the standard model
- Applications

The 2007 Long Range Plan



Recommendations of the 2007 NSAC Long Range Plan

Recommendation I

- We recommend completion of the 12 GeV CEBAF Upgrade at Jefferson Lab. The Upgrade will enable new insights into the structure of the nucleon, the transition between the hadronic and quark/gluon descriptions of nuclei, and the nature of confinement.

Recommendation II

- We recommend construction of the Facility for Rare Isotope Beams (FRIB), a world-leading facility for the study of nuclear structure, reactions, and astrophysics. Experiments with the new isotopes produced at FRIB will lead to a comprehensive description of nuclei, elucidate the origin of the elements in the cosmos, provide an understanding of matter in the crust of neutron stars, and establish the scientific foundation for innovative applications of nuclear science to society.

Recommendation III

- We recommend a targeted program of experiments to investigate neutrino properties and fundamental symmetries. These experiments aim to discover the nature of the neutrino, yet-unseen violations of time-reversal symmetry, and other key ingredients of the New Standard Model of fundamental interactions. Construction of a Deep Underground Science and Engineering Laboratory is vital to U.S. leadership in core aspects of this initiative.

Recommendation IV

- The experiments at the Relativistic Heavy Ion Collider have discovered a new state of matter at extreme temperature and density—a quark-gluon plasma that exhibits unexpected, almost perfect liquid dynamical behavior. We recommend implementation of the RHIC II luminosity upgrade, together with detector improvements, to determine the properties of this new state of matter.

Recommendations for the further future

Initiatives

Observations

projecting based on previous charges

- NSAC has repeatedly answered charges like this before including 1985, 1992 and 2005.
- If it has budget guidance, It will require detailed consideration of the budget. For example, FY13 + flat-flat budgets for 5 years may leave the field with only 1 major facility.
- We are likely ask to implement the priorities and recommendations of the 2007 Long Range Plan

Subcommittee Membership

If it is a charge for a Long Range Plan, we will follow our history of dealing with this, with as much community input as possible

If it is a charge of implementation the 2007 LRP, we want to put together a subcommittee to address the charge as soon as possible.

Because of the uncertainty in the time scale, it was important to identify the chair as soon as possible.

I have had informal discussions with many members of the community as to who would be suitable.

Subcommittee chair

I uniformly got the advice that there was one person who was uniquely qualified to do this.

- Experience in responding to similar charges
- In a unique position to understand the process and connotations of the 2007 Long Range Plan
- Has the broad trust of the entire community

We are extremely fortunate that if an implementation subcommittee is called for, Bob Tribble has agreed to chair this subcommittee.

What do we need from NSAC

- Suggestions for members of the subcommittee
 - Balance and diversity are essential
 - Who from outside nuclear physics would help convince the agencies and the world that this is a fair and thorough process?
- Suggestions for our charge letter to the subcommittee that we believe would help focus its deliberations without changing the intent of the charge
- Discussion now, but please send me you advice by Friday March 16 for members of the subcommittee

Goals

- It is absolutely essential that the process is viewed as fair and deliberate
- The recommendations must be based on the science opportunities and the future of the field, not institutional concerns.
- We must carry out a process that entire field will embrace and speak with one voice.
- Circling the wagons and shooting inward is destructive.
- Making arguments about the relative value of other Office of Science or NSF programs is destructive
- We cannot make decisions based on possible external political factors

Goal

- If we do this well, we can communicate the value of our science and the wisdom in our planning decisions.
- NSAC is widely viewed as being able to respond coherently to the issues at hand and that thus the agencies pay very close attention to our recommendations.
- We must respond to the charge