

CERN-ECFA-NuPECC

Workshop on the LHeC

Electron-proton and electron-ion collisions at the LHC

....from

**NuPECC Long Range Plan
2010**

**the Nuclear Physics Priorities
in Europe**

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Long Range Plan 2010

Nuclear Physics projects have long lead times and thus considered planning ahead via Long Range Plans

Research Infrastructures for nuclear Physics need:

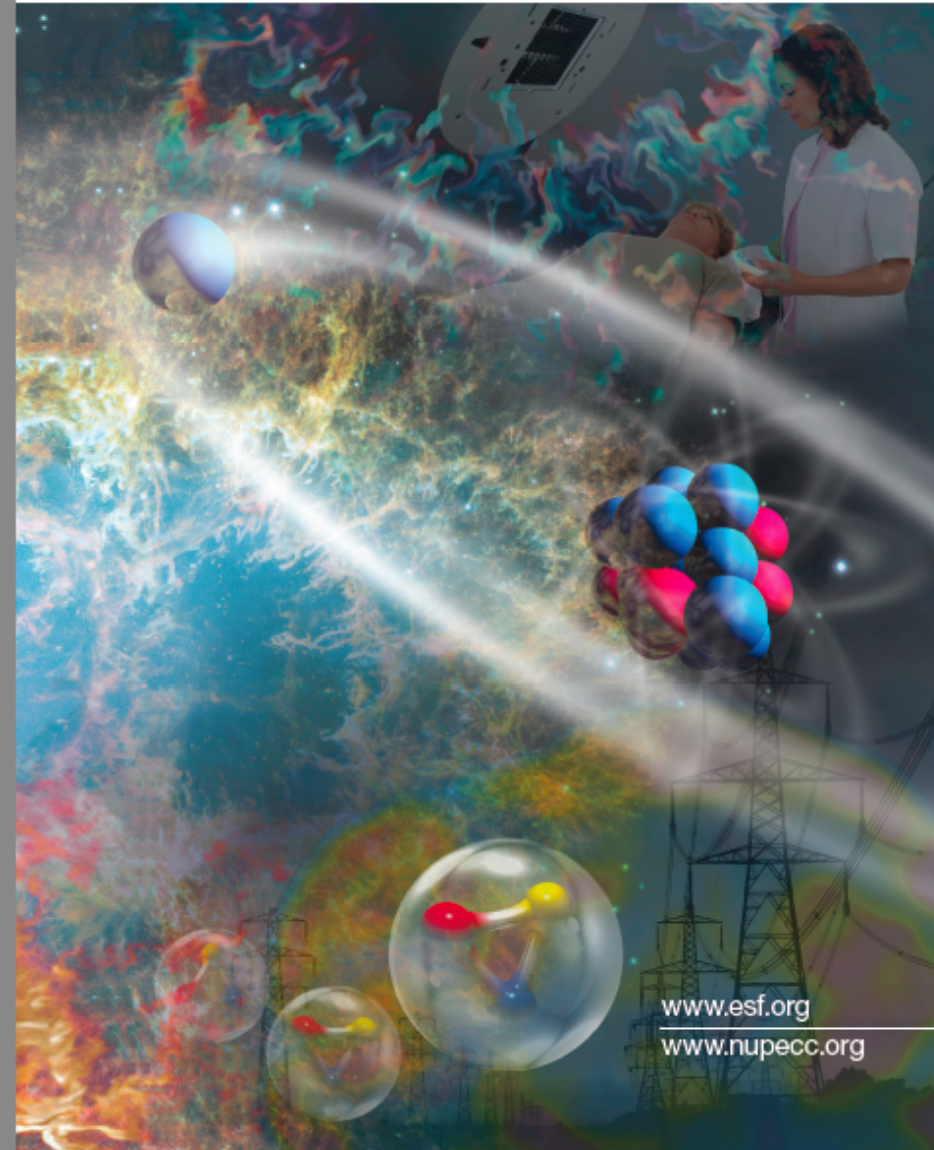
- Strong science case
- Strong support of the entire scientific community
- Strong support of policy makers
- Coherent action of funding agencies

EUROPEAN
SCIENCE
FOUNDATION
SETTING SCIENCE AGENDAS FOR EUROPE

FORWARD LOOK

Perspectives of Nuclear
Physics in Europe

NuPECC Long Range Plan 2010



- **Executive Summary**
 - Purpose, Scientific & Societal Scope, Objectives
 - Science Case
 - Research Infrastructures & Networking
 - Scientific Themes
- **Recommendations & Roadmap**
- **Research Infrastructures & Networking**
 - Existing Research Infrastructure & Upgrades
 - Future Research Infrastructures
 - Collaboration at European and Global Level
- **Scientific Themes**
 - Hadron Physics
 - Phases of Strongly Interacting Matter
 - Nuclear Structure & Dynamics
 - Nuclear Astrophysics
 - Fundamental Interactions
 - Nuclear Physics Tools & Applications

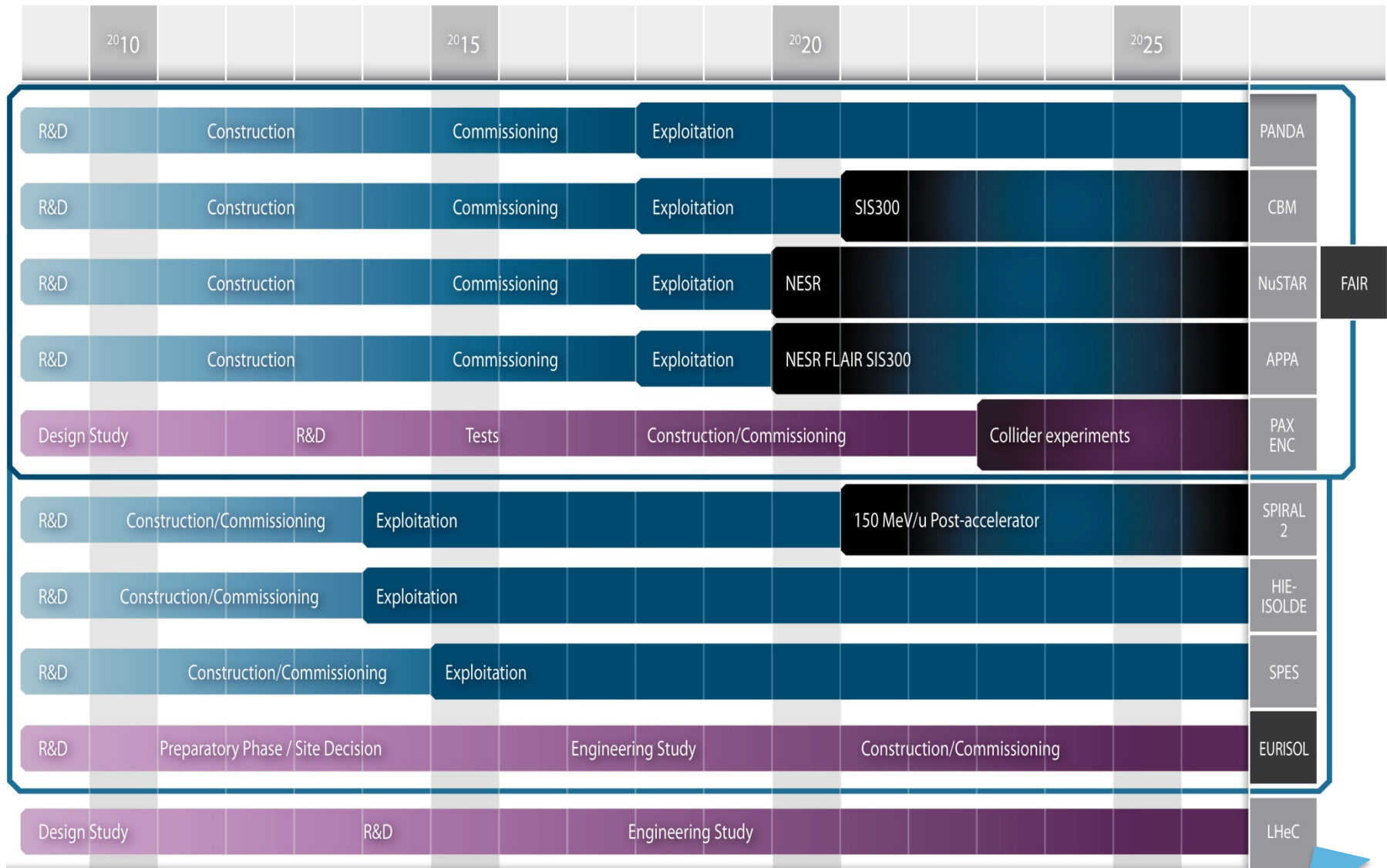
from the NuPECC LRP2010

Open key questions in hadron physics are:

- How does the strong interaction confine quarks and gluons into hadrons?
- What precisely is the internal structure of hadrons in terms of fundamental quarks and gluon degrees of freedom?
- What is the role of quarks and self-interacting gluons in nuclei?

Present research in European laboratories, JLAB and JPARC

ROADMAP FOR NEW LARGE SCALE FACILITIES



LHeC

In the LRP2010.....one finds :

The LHeC may thus become the world's highest resolution microscope of proton and nuclear structure in making efficient use of the large investments in the LHC.

- **Explore the new QCD frontier:
strong color fields in nuclei**
- **Precisely image the sea-quarks and gluons in the nucleon**

Comments and Conclusions

- Several research objectives of LHeC are interesting to the hadron physics community willing to make a major step ahead in the future in the domain of quarks and hadron dynamics
- NuPECC support to the R&D for LHeC is in the LRP2010 and will continue this support in the future.

This is because Nuclear and Particle Physics are cognate fields with common interests regarding the development of accelerators and large-scale experimental facilities such as LHeC.