

NSAC Long Range Plan

NuPECC

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OLD DOMINION
UNIVERSITY

Nuclear Data Charge

- Charge received by NSAC on April 13, 2022
- “assess the challenges, opportunities, and priorities for effective stewardship of nuclear data.”
- Two reports have been finalized. Available at links here:
<https://science.osti.gov/np/nsac/Reports>
 - [Report 1](#): assessment of the status of the US Nuclear Data Program (USNDP), including accomplishments and needs in basic science and several key applications
 - [Report 2](#): challenges to nuclear data stewardship and a strategic plan to guide federal investment in USNDP



Long Range Plan Charge from DOE and NSF to NSAC

- scope and scientific **challenges** of nuclear physics today
- **Progress** since the last LRP; **impacts** in and out of the field
- Most compelling **scientific opportunities** in next decade
- Strategy for use of existing and planned **capabilities**
- **Required resources and funding** levels to maintain world leadership position
 - New facilities, mid-scale instrumentation, major items of equipment (MIE)
 - Constant effort, modest growth, CHIPS and Science act authorization
- **International** coordination and collaborations
- Cross cutting **interdisciplinary** opportunities (interagency, etc)
- Mutually beneficial interactions with other disciplines
- **Integrate efforts to promote a diverse, equitable, and sustainable workforce**



LRP Writing Committee

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International Observers:
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The Long Range Plan Process

- Charge delivered to NSAC on July 13
- Committee formed
- DNP named conveners to organize three townhalls
 - QCD Sept. 23– 25 (MIT)
 - Nuclear Structure, Reactions, & Astrophysics Nov. 14 - 16 (Argonne)
 - Fundamental Symmetries Dec. 13 – 15 (Chapel Hill)
- Additional groups also produced white papers
- White papers due Feb. 28
- Rollout planning Initiated
- Public facing website: NuclearScienceFuture.org
- LRP Committee works on writing the bulk of the document
- Resolution Meeting: July 10 – 14 in person (set priorities for the community)
- Finish Report, executive summary, communication plan

Initial report due to DOE and NSF by October 2023



Goals

- Answer the charge; recommend scientific priorities for the next 10 years
- Produce a readable report that
 - Summarizes the incredible science
 - Clearly articulates the impact (world leadership, interdisciplinary, HEP, applications, workforce, etc)
 - Helps **DOE and NSF leaders** understand and make the case for investment in nuclear science
 - Informs **congress** (staffers)

We need to keep in mind the audience!



Subcommittees (Chairs)

- **QCD** (Richard Milner)
- **Fundamental Symmetries** (Brent VanDevender)
- **Nuclear Structure, Reactions & Astrophysics** (Ani Aprahamian)
- **Workforce Development** (Shelly Leshner)
 - includes education and DEI
- **Applications** (Calvin Howell and Mike Carpenter)
- **International Context** (Krishna Kumar)
- **Crosscutting/interdisciplinary scientific opportunities** (Ian Cloet)
 - QIS, AI/ML, Accelerator Science
- **Impact and synergies with other fields** (Jorge Piekarewicz)
- **Budget** (Sherry Yennello)
- **Theory** (Filomena Nunes)
- **Facilities** (Haiyan Gao)

Thank you for the terrific NuPECC publication on applications!



Outline for LPR report

- Executive Summary
- The Story of Nuclear Physics
- QCD
- Nuclear Structure and Reactions
- Nuclear Astrophysics
- Fundamental Symmetries, Neutrons, and Neutrinos
- Theory
- Workforce
- Facilities
- Emerging Technologies and Innovation
- Applications
- Budgets

We hope to have QR codes and links in the LRP that will lead to a permanently maintained site with additional content, videos, simulations, etc.



Ongoing

- Understand the budget
 - We invited the community to submit budget requests
 - We will ultimately use the budget envelope defined by the CHIPS and Science Act to define our priorities
 - Must also consider flat budget and modest growth
- Workforce
 - Gathered statistics; survey graduate students; salary information
 - Estimate the cost of funding existing people at an adequate level
 - Additional funds needed for research budget to do the outstanding science
- Initiate task force on Communication/Rollout
- Settle agenda for July resolution meeting
- Identify reviewers/science writers/graphics



2015 Long Range Plan

- Four recommendations
 - Capitalize on investments made
 - Ton-scale neutrinoless double beta decay
 - EIC – highest priority for new facility construction
 - Increased investment in small-scale and mid-scale projects
- Two Initiatives
 - Theory
 - Detector and Accelerator R&D
- Workforce, Education, and Outreach

