Outline
• Staff in NSF/MPS/PHY
• FY24 & FY25 Budget Info
• Funding Announcements and Successes
NSF/MPS/PHY Personnel

- Sethuraman Panchanathan – Director
- Denise Caldwell – Acting Assistant Director for MPS
- Saúl González – Physics Division Director
- Michael Cavagnero – Acting Deputy Division Director
- Bogdan Mihaila – Nuclear Theory Program Director
- Senta (Vicki) Greene – Nuclear Physics Program Director
- Allena Opper – Nuclear Physics Program Director

https://beta.nsf.gov/careers/openings/mps/phy/phy-21-001
www.nsf.gov/careers/rotator
## FY24 Budget: President’s Request, House, Senate ($M)

<table>
<thead>
<tr>
<th>NSF by Account</th>
<th>FY 2022 Actual</th>
<th>FY 2023 Estimate Total</th>
<th>FY 2024 Request</th>
<th>House Mark</th>
<th>Senate Mark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research &amp; Related Activities</td>
<td>$6,964.66</td>
<td>$7,826.80</td>
<td>$9,029.90</td>
<td>$7,867</td>
<td>$7,608</td>
</tr>
<tr>
<td>STEM Education</td>
<td>$1,146.72</td>
<td>$1,371.00</td>
<td>$1,444.18</td>
<td>$1,006</td>
<td>$1,228</td>
</tr>
<tr>
<td>Major Res. Equip. &amp; Fac. Construction</td>
<td>$120.60</td>
<td>$187.23</td>
<td>$304.67</td>
<td>$254</td>
<td>$187</td>
</tr>
<tr>
<td>Agency Operations &amp; Award Mgmt.</td>
<td>$420.21</td>
<td>$463.00</td>
<td>$503.87</td>
<td>$472</td>
<td>$448</td>
</tr>
<tr>
<td>Office of Inspector General</td>
<td>$18.89</td>
<td>$23.39</td>
<td>$26.81</td>
<td>$27</td>
<td>$23</td>
</tr>
<tr>
<td>National Science Board</td>
<td>$4.52</td>
<td>$5.09</td>
<td>$5.25</td>
<td>$5</td>
<td>$5</td>
</tr>
<tr>
<td><strong>Total, NSF Discretionary Funding</strong></td>
<td><strong>$8,675.61</strong></td>
<td><strong>$9,876.51</strong></td>
<td><strong>$11,314.68</strong></td>
<td><strong>$9,630</strong></td>
<td><strong>$9,500</strong></td>
</tr>
</tbody>
</table>
NSF Appropriations – figure from the AIP
## FY25 President’s Budget Request – NSF ($M)

<table>
<thead>
<tr>
<th>NSF by Account</th>
<th>FY 2023 Base Plan¹</th>
<th>FY 2024 (TBD)</th>
<th>FY 2025 Request</th>
<th>Change over FY 2023 Base Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research &amp; Related Activities²</td>
<td>$7,631.02</td>
<td>-</td>
<td>$8,045.32</td>
<td>$414.30 (5.4%)</td>
</tr>
<tr>
<td>STEM Education²</td>
<td>$1,229.28</td>
<td>-</td>
<td>$1,300.00</td>
<td>$70.72 (5.8%)</td>
</tr>
<tr>
<td>Major Res. Equip. &amp; Fac. Construction</td>
<td>$187.23</td>
<td>-</td>
<td>$300.00</td>
<td>$112.77 (60.2%)</td>
</tr>
<tr>
<td>Agency Operations &amp; Award Mgmt.</td>
<td>$463.00</td>
<td>-</td>
<td>$504.00</td>
<td>$41.00 (8.9%)</td>
</tr>
<tr>
<td>Office of Inspector General</td>
<td>$23.39</td>
<td>-</td>
<td>$28.46</td>
<td>$5.07 (21.7%)</td>
</tr>
<tr>
<td>National Science Board</td>
<td>$5.09</td>
<td>-</td>
<td>$5.22</td>
<td>$0.13 (2.6%)</td>
</tr>
<tr>
<td><strong>Total, NSF Discretionary Funding</strong></td>
<td>$9,539.01</td>
<td>-</td>
<td>$10,183.00</td>
<td>$643.99 (6.8%)</td>
</tr>
<tr>
<td>Advancing Scientific Discovery: Artificial Intelligence</td>
<td>-</td>
<td>-</td>
<td>50.00</td>
<td>50.00 (N/A)</td>
</tr>
<tr>
<td>STEM Education - H-1B Visa</td>
<td>192.54</td>
<td>-</td>
<td>138.93</td>
<td>-53.61 (-27.8%)</td>
</tr>
<tr>
<td>Donations</td>
<td>40.00</td>
<td>-</td>
<td>40.00</td>
<td>-</td>
</tr>
<tr>
<td><strong>Total, NSF Mandatory Funding</strong></td>
<td>$232.54</td>
<td>-</td>
<td>$228.93</td>
<td>-$3.61 (-1.6%)</td>
</tr>
<tr>
<td><strong>Total, NSF Budgetary Resources</strong></td>
<td>$9,771.55</td>
<td>-</td>
<td>$10,411.93</td>
<td>$640.37 (6.6%)</td>
</tr>
</tbody>
</table>

Totals exclude reimbursable amounts.

¹ Reflects the anticipated transfer of $15.0 M of carryover within R&RA to AOAM to be completed in FY 2024.

² FY 2023 R&RA and STEM Education accounts are restated to show consolidation of NSF mission support activities within R&RA comparably with FY 2025; STEM Education account shifts $16.72 million to R&RA in FY 2023 display column.
### FY25 President’s Budget Request – MPS ($M)

<table>
<thead>
<tr>
<th></th>
<th>FY 2023 Base Plan¹</th>
<th>FY 2024 (TBD)</th>
<th>FY 2025 Request</th>
<th>Change over FY 2023 Base Plan Amount</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Astronomical Sciences (AST)</td>
<td>$288.21</td>
<td>-</td>
<td>$318.53</td>
<td>$30.32</td>
<td>10.5%</td>
</tr>
<tr>
<td>Chemistry (CHE)</td>
<td>264.99</td>
<td>-</td>
<td>264.99</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Materials Research (DMR)</td>
<td>334.50</td>
<td>-</td>
<td>345.72</td>
<td>11.22</td>
<td>3.4%</td>
</tr>
<tr>
<td>Mathematical Sciences (DMS)</td>
<td>248.40</td>
<td>-</td>
<td>248.40</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Physics (PHY)</strong></td>
<td>308.65</td>
<td>-</td>
<td>312.90</td>
<td>4.25</td>
<td>1.4%</td>
</tr>
<tr>
<td>Office of Strategic Initiatives (OSI)</td>
<td>215.20</td>
<td>-</td>
<td>191.09</td>
<td>-24.11</td>
<td>-11.2%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$1,659.95</strong></td>
<td>-</td>
<td><strong>$1,681.63</strong></td>
<td><strong>$21.68</strong></td>
<td><strong>1.3%</strong></td>
</tr>
</tbody>
</table>
Four Major Themes
1. Advance Emerging Industries for National and Economic Security
2. Create Opportunities Everywhere
3. Build a Resilient Planet
4. Strengthen Research Infrastructure
Early Faculty Career Development Program (CAREER)

• Awards in support of early-career faculty who have the potential to serve as academic role models in research and education, and to lead advances in the mission of their department or organization.

• Eligibility – must be untenured assistant professor in position that is at least 50% tenure-track

• Required department chair may not be a letter of support; should
  o Affirm PI’s pre-tenure status
  o Indicate that the proposed research and education objectives of the proposal are supported by and advance department’s goals
  o Describe how proposed goals are related to mission of department and how dept will provide appropriate mentoring

• Submission through Research.gov or Grants.gov (not FastLane 😞)

• Deadline: Fourth Wednesday in July ⇒ July 24, 2024

NSF 22-586
Major Research Instrumentation (MRI) NSF 23-519

• Three tracks:
  o Track 1  $100 k < $ from NSF < $1.4 M; up to 2/university
  o Track 2  $1.4 M < $ from NSF < $4 M; 1/university
  o Track 3   acquisition, development, installation, operation, and maintenance of equipment and instrumentation to reduce consumption of helium; 1/university

• Two types:  development and acquisition; both need to be “shovel ready”

• Deadlines & details
  o October 15 – November 15, 2024, (a window of opportunity)
  o [Link to MRI Program Website]
  o [Link to Funding Opportunities Website]
  o Contact your program directors well ahead of time to discuss & avoid pitfalls
  o Awards above $1M compete across the entire Foundation
  o 30% cost share req’d for PhD granting institutions
Funding Announcements

PHY Investigator Initiated Research  NSF 23-615

All proposals submitted to the Division of Physics programs must go through this solicitation.

- **Deadlines:** Second Tuesday in December for *Experimental & Theoretical Nuclear Physics* → December 10, 2024 5 pm in your home institution’s time zone
- Follow instructions that are specific to this solicitation; non-compliant proposals may be returned without review
  - Updated instructions regarding Current and Pending Support and Biographical Sketches of senior personnel
- Submission through Research.gov or Grants.gov

Questions – contact cognizant program director.
Newly observed 68-keV isomer found in $^{37}$Si using bg timing techniques (a), which validates SM predictions in neutron-rich, odd-A Si isotopes (b).

Year 2 of the Physics Summer Camp for Students with ASD was a big success! We nearly doubled the number of campers from year 1 to year 2 while maintaining a high degree of engagement with physics and STEM. We look forward to year 3 of the camp!

https://www.physics.msstate.edu/phycamp

By combining astronomical observations and laboratory experiments, FRIB scientists extract nuclear matter equation of state over a wide range of densities shedding light on the neutron star properties. Incorporating nuclear physics data significantly reduces the uncertainties of the derived equation of state.
RUI: Studies of Relativistic Heavy Ions Collisions in ALICE at the LHC
Proton form factor, charge radius, two-photon exchange, lepton universality
@ PSI elastic scattering of 115 – 210 MeV/c e±, μ± from hydrogen
2024: 5 months beam time awarded and scheduled
2025: similar beam time expected
Atomic Clock → Nuclear Clock!

• Current standard: atomic clock using hyperfine transitions of $^{133}\text{Cs}$
  o $\delta = 10^{-16}$

• Nuclear Clock: transition of a nucleus
  o Less susceptible to EM perturbations
  o $\delta = 10^{-19}$
  o Challenge: radiation source more energetic than optical lasers

• European group: VUV laser $^{229m}\text{Th}$
• Also observed by US groups
• Optical nuclear clocks?

For the latest updates:
https://www.nsf.gov/physics

Contact us at:
• Bogdan Mihaila bmihaila@nsf.gov or call (703)292-8235
• Vicki Greene segreene@nsf.gov or call (703)292-5183
• Allena Opper aopper@nsf.gov or call (703)292-8958
Thank You!