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# The National Science Foundation: FY2017 Appropriations Status and Funding History

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## Summary

The National Science Foundation (NSF) supports both basic research and education in the non-medical sciences and engineering. NSF is a major source of federal support for U.S. university research, especially in certain fields such as mathematics and computer science. It is also responsible for significant shares of the federal science, technology, engineering, and mathematics (STEM) education program portfolio and federal STEM student aid and support.

Overall, the Obama Administration seeks \$7.964 billion for the NSF in FY2017, a \$501 million (6.7%) increase over the FY2016 estimate of \$7.463 billion. This request includes \$7.564 billion in discretionary budget authority and \$400 million in new one-time mandatory budget authority.

NSF has six major appropriations accounts: Research and Related Activities (RRA), Education and Human Resources (EHR), Major Research Equipment and Facilities Construction (MREFC), Agency Operations and Award Management (AOAM), National Science Board (NSB), and Office of Inspector General (OIG). The FY2017 request would increase total budget authority in three accounts relative to the FY2016 estimate: RRA by \$392 million (6.5%), EHR by \$73 million (8.3%), and AOAM by \$43 million (13%). The request would provide NSB and OIG with about the same amount as in FY2016 and decrease MREFC account funding by \$7 million (3.6%). The new mandatory budget funding request is split between two accounts—RRA (\$346 million) and EHR (\$54 million). Mandatory funding is not usually part of NSF's budget request for major accounts.

As reported by the Senate, S. 2837 would provide a total of \$7.510 billion to NSF for FY2017. This amount is \$46 million (0.6%) above the FY2016 estimated funding level, \$54 million (0.7%) below the FY2017 discretionary funding request, and \$454 million (5.7%) below the request including new mandatory funding. The bill would keep funding for the major accounts nearly the same as the FY2016 estimate, except for MREFC, which would increase by \$46 million (23%).

As reported by the House, H.R. 5393 would provide a total of \$7.406 billion to NSF for FY2017. This amount is \$57 million (0.8%) below the FY2016 estimated funding level, \$158 million (2.1%) below the President's FY2017 discretionary funding request, and \$558 million (7.5%) below the request including new mandatory funding. The bill would keep funding for the EHR, NSB, and OIG accounts nearly the same as in the FY2016 estimate, increase the RRA and AOAM accounts by \$46 million (0.8%) and \$10 million (3%), respectively, and decrease the MREFC account by \$113 million (57%).

The Continuing Appropriations and Military Construction, Veterans Affairs, and Related Agencies Appropriations Act, 2017 (P.L. 114-223), provides funding for the NSF through December 9, 2016, at the FY2016 funding rate subject to a 0.496% across-the-board decrease.

Overall growth in the NSF budget slowed after FY2003. Median annual growth in NSF funding was 9% between FY1953 and FY2003 and 3% between FY2004 and FY2016. Most of NSF's funding supports scientific and technological research. Further, the portion of NSF spending that goes to research increased over the past decade. Within the NSF total, RRA has accounted for the lion's share of growth in obligations since FY2003. Agency appropriations levels were last authorized in FY2010 and expired in FY2013; various reauthorization measures have been introduced in the 114<sup>th</sup> Congress that include proposed funding levels for FY2017.

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## Introduction

The National Science Foundation (NSF) supports both basic research and education in the non-medical sciences and engineering. Congress established the foundation through the National Science Foundation Act of 1950 to “promote the progress of science; to advance the national health, prosperity, and welfare; to secure the national defense; and for other purposes.” The NSF is a major source of federal support for U.S. university research, especially in certain fields such as mathematics. It is also responsible for significant shares of the federal science, technology, engineering, and mathematics (STEM) education program portfolio and federal STEM student aid and support.

This report describes selected items from the Administration’s FY2017 budget request for NSF and tracks legislative action on FY2017 appropriations to the foundation. It also details selected authorizations of NSF appropriations proposed in the 114<sup>th</sup> Congress, summarizes budget and appropriations action from FY2015 and FY2016, and presents information on historical funding for the foundation.<sup>1</sup>

NSF has six major appropriations accounts: Research and Related Activities (RRA), Education and Human Resources (EHR), Major Research Equipment and Facilities Construction (MREFC), Agency Operations and Award Management (AOAM), National Science Board (NSB), and the Office of the Inspector General (OIG). At times, authorizations and appropriations have been specified at the RRA subaccount level, and NSF’s budget justifications detail activities and obligations at that level. The majority of NSF’s primary mission activities are funded through RRA, EHR, and MREFC. NSF adopted its current appropriations account structure in FY2003. In general, NSF’s major accounts have been comparable since then.<sup>2</sup>

Appropriations to NSF are typically included in annual Commerce, Justice, Science and Related Agencies Appropriations Acts. (The Congressional Research Service tracks these acts on CRS.gov, at <http://www.crs.gov/AppropriationsStatusTable/index>.) NSF’s budget justifications are published on the agency’s website at <http://www.nsf.gov/about/budget/>. For more information about NSF’s last enacted authorization of appropriations, which expired in FY2013, see CRS Report R43880, *The America COMPETES Acts: An Overview*, by (name redacted).

## FY2017 Budget and Appropriations Actions

The Obama Administration seeks \$7.964 billion for NSF in FY2017, a \$501 million (6.7%) increase over the FY2016 estimate of \$7.463 billion (see **Table 1**). This request includes \$7.564 billion in discretionary budget authority and \$400 million in new one-time mandatory budget authority (excluding new mandatory funding, the total NSF request is \$101 million (1.3%) greater than the FY2016 appropriation).

The request would increase budget authority in three accounts relative to the FY2016 estimate: RRA by \$392 million (6.5%), EHR by \$73 million (8.3%), and AOAM by \$43 million (13%). The NSB and OIG accounts would receive about the same amount as in FY2016. Funding for the MREFC account would decrease by \$7 million (3.6%). The requested mandatory budget funding

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<sup>1</sup> A similar report focusing on prior fiscal years was originally prepared by CRS specialist (name redacted) (see CRS Report R44170, *The National Science Foundation: FY2016 Budget Request and Funding History*).

<sup>2</sup> In FY2008, NSF shifted the EPSCoR program from the Education and Human Resources (EHR) account to the Research and Related Activities (RRA) account.

is split between two accounts—\$346 million for RRA and \$54 million for EHR. It is not typical for NSF to request or receive mandatory funding for major accounts.<sup>3</sup>

As reported by the Senate Committee on Appropriations, S. 2837, the Commerce, Justice, Science, and Related Agencies Appropriations Act, 2017, would provide a total of \$7.510 billion to NSF for FY2017. This amount would be \$46 million (0.6%) above the FY2016 estimated funding level, \$54 million (0.7%) below the President’s FY2017 discretionary funding request, and \$454 million (5.7%) below the President’s request including new mandatory funding. This bill would keep funding for each of the major accounts at nearly the same level as the FY2016 estimate, except for the MREFC account, which would increase by \$46 million (23%).<sup>4</sup>

As reported by the House Committee on Appropriations, H.R. 5393, the Commerce, Justice, Science, and Related Agencies Appropriations Act, 2017, would provide a total of \$7.406 billion to NSF for FY2017. This amount would be \$57 million (0.8%) below the FY2016 estimated funding level, \$158 million (2.1%) below the President’s FY2017 discretionary funding request, and \$558 million (7.5%) below the President’s request including new mandatory funding. The bill would keep funding for the EHR, NSB, and OIG accounts nearly the same as the FY2016 estimate, increase the RRA and AOAM accounts by \$46 million (0.8%) and \$10 million (3%), respectively, and decrease the MREFC account by \$113 million (57%).<sup>5</sup>

The Continuing Appropriations and Military Construction, Veterans Affairs, and Related Agencies Appropriations Act, 2017 (P.L. 114-223) provides funding for the NSF through December 9, 2016, at the FY2016 funding rate subject to a 0.496% across-the-board decrease.

The FY2017 NSF budget justification highlights many of the same programs as in FY2016. Specifically, the document identifies two areas of major emphasis, four cross-foundation investments, and six on-going NSF-wide priorities. The two areas of major emphasis—a new classification in the FY2017 budget document—are Clean Energy Research and Development (R&D) and strengthening support for core activities:

- The FY2017 request would increase funding across multiple offices and RRA directorates for Clean Energy R&D by \$141 million to \$512 million total, a 37.9% increase. Clean Energy R&D appears to broadly include Clean Energy Technology, listed as one of the cross-foundation investments in FY2016.
- Strengthening support for core activities would be funded by the new mandatory budget authority request of \$400 million to support “fundamental, curiosity-driven research,” with a focus on supporting early-career investigators. The budget justification reports that the mandatory funding would allow for an estimated 800 additional research grants to be funded.

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<sup>3</sup> NSF receives a small amount of mandatory funding from H-1B Nonimmigrant Petitioner Fees (40% of total H-1B receipts collected, as authorized by P.L. 105-277 and P.L. 108-447). These H-1B fees are used for two programs: the low-income scholarship program, Scholarships in STEM (S-STEM); and the Innovative Technology Experiences for Students and Teachers (ITEST) program. FY2017 fees for the H-1B account are projected to be \$100 million, equal to the FY2016 estimate. See NSF’s budget justification, p. EHR-21, for more information.

<sup>4</sup> U.S. Congress, Senate Committee on Appropriations, *Departments of Commerce and Justice, Science, and Related Agencies Appropriations Bill, 2017*, report to accompany S. 2837, 114<sup>th</sup> Cong., 2<sup>nd</sup> sess., April 21, 2016, S.Rept. 114-239 (Washington: GPO, 2016), p. 116.

<sup>5</sup> U.S. Congress, House Committee on Appropriations, *Commerce, Justice, Science, and Related Agencies Appropriations Bill, 2017*, report to accompany H.R. 5393, 114<sup>th</sup> Cong., 2<sup>nd</sup> sess., June 7, 2016, H.Rept. 114-605 (Washington: GPO, 2016), pp. 54-71.

The foundation's four cross-foundation investments aim to bring researchers from different fields of science and engineering together to address cross-disciplinary questions. As in FY2016, these activities include the following:

- Understanding the Brain (UtB, \$142 million requested, 3.6% decrease from FY2016 estimate);
- Risk and Resilience (\$43 million requested, 4.9% increase);
- Innovations at the Nexus of Food, Energy, and Water Systems (INFEWS, \$62 million requested, 27.7% increase); and
- NSF Inclusion across the Nation of Communities of Learners of Underrepresented Discoverers in Engineering and Science (NSF INCLUDES, \$16 million requested, 3.2% increase).

NSF identifies six ongoing foundation-wide priorities for FY2017. These include the following:

- Cyber-Enabled Materials, Manufacturing, and Smart Systems (CEMMSS, \$257 million requested, 0.3% increase over the FY2016 estimate);
- Cyberinfrastructure Framework for 21<sup>st</sup> Century Science, Engineering, and Education (CIF21, \$100 million requested, 24.4% decrease);
- Innovation Corps (I-Corps, \$30 million requested, no change);
- Research at the Interface of Biological, Mathematical, and Physical Sciences (BioMaPS, \$30 million requested, 4.8% decrease);
- Science, Engineering, and Education for Sustainability (SEES, \$52 million requested, 29.8% decrease); and
- Secure and Trustworthy Cyberspace (SaTC, \$150 million requested, 15.4% increase).

The NSF Research Traineeship (NRT) program is no longer included in the foundation-wide priorities list, though NRT is noted as a crosscutting program with funding from the RRA and EHR accounts. The overall FY2017 request for NRT is \$58.6 million, an 8.3% increase from the FY2016 estimate (including a 9.4% decrease in requested funding through RRA and a 21.4% increase through EHR); this remains lower than the \$74.4 million in enacted funding level for NRT in FY2015. For another widely tracked crosscutting program, the Graduate Research Fellowship (GRF), the FY2017 request is about the same as the FY2016 estimate (\$332 million).

The report to accompany S. 2837, S.Rept. 114-239 (referred to as the "Senate report" in this section), specifically addresses one of these NSF-wide funding priorities, stating "The Committee supports the NSF's request for the Innovation Corps [I-Corps] program ..." The report to accompany H.R. 5393, H.Rept. 114-605 (referred to as the "House report" in this section), recommends \$5 million above the requested level for I-Corps "to enable greater participation nationally." Broadly, both reports express support for programs that focus on such things as cybersecurity and broadening participation in STEM fields from underrepresented populations. As reported, neither S. 2837 nor H.R. 5393 would include the \$400 million in new mandatory funding requested to strengthen support for core services.

**Table I. NSF Funding by Major Account, FY2015-FY2017**  
(budget authority in millions of dollars)

Account	FY2015 Actual	FY2016 Estimate	Request	FY2017		
				House Committee-Reported	Senate Committee-Reported	Enacted
<b>Research and Related Activities (RRA)</b>	<b>6041.6</b>	<b>6033.7</b>	<b>6425.4</b>	<b>6079.4</b>	<b>6033.6</b>	
Discretionary	6041.6	6033.7	6079.4	6079.4	6033.6	
Mandatory	0	0	346.0	0	0	
<b>Education and Human Resources (EHR)</b>	<b>886.3</b>	<b>880.0</b>	<b>952.9</b>	<b>880.0</b>	<b>880.0</b>	
Discretionary	886.3	880.0	898.9	880.0	880.0	
Mandatory	0	0	54.0	0	0	
<b>Major Research Equipment and Facilities Construction (MREFC)</b>	<b>144.8</b>	<b>200.3</b>	<b>193.1</b>	<b>87.1</b>	<b>246.6</b>	
<b>Agency Operations and Award Management (AOAM)</b>	<b>306.6</b>	<b>330.0</b>	<b>373.0</b>	<b>340.0</b>	<b>330.0</b>	
<b>National Science Board (NSB)</b>	<b>4.2</b>	<b>4.4</b>	<b>4.4</b>	<b>4.4</b>	<b>4.4</b>	
<b>Office of the Inspector General (OIG)</b>	<b>14.6</b>	<b>15.2</b>	<b>15.2</b>	<b>15.2</b>	<b>15.2</b>	
<b>NSF, Total</b>	<b>7398.0</b>	<b>7463.5</b>	<b>7964.0</b>	<b>7406.1</b>	<b>7509.8</b>	
Discretionary	7398.0	7463.5	7564.0	7406.1	7509.8	
Mandatory	0	0	400.0	0	0	

**Source:** FY2017 NSF Budget Request to Congress; H.R. 5393 as reported by the House Committee on Appropriations, and H.Rept. 114-605; and S. 2837, as reported by the Senate Committee on Appropriations, and S.Rept. 114-239.

**Notes:** The term “n/s” means “not specified.” Totals may not add due to rounding.

## Research and Related Activities (RRA)

The Obama Administration seeks a \$392 million (6.5%) increase in funding for RRA in FY2017, for a total of \$6.425 billion. Of this amount, \$6.079 billion is requested as discretionary funding and \$346 million is requested as new mandatory budget authority. As reported by the Senate Committee on Appropriations, S. 2837 would provide \$6.034 billion in discretionary funding, keeping RRA funding at the same level as in FY2016. As reported by the House Committee on Appropriations, H.R. 5393 would provide \$6.079 billion in discretionary funding, which is the same as the level of requested discretionary funding and represents a \$45.8 million increase over FY2016. Neither bill would provide mandatory funding.

The FY2017 budget request seeks increases for all of the RRA subaccounts except for the U.S. Arctic Research Commission (USARC), which would not change (see **Table 2**). The largest percentage increase would go to Engineering (ENG, 9.4%). The largest increase in dollars would go to Mathematical and Physical Sciences (MPS, \$87.3 million). Other subaccounts would



receive an increase of between 6.0% and 6.5%, except for Integrated Activities (IA), which would receive a 2.9% increase. The FY2017 request also includes an increase for the widely tracked Experimental Program to Stimulate Competitive Research (EPSCoR) from \$160 million to \$171 million (an increase of 6.7%), of which \$8.56 million is requested as new mandatory funding.

S. 2837 does not specify funding allocations within RRA. However, Senate report language does specify funding levels for three programs: \$10 million for the Historically Black Colleges and Universities Excellence in Research program, \$18 million for the Advancement of Women in Academic Science and Engineering Careers program (ADVANCE), and “not less than the fiscal year 2016 enacted level for EPSCoR” (\$160 million).

Similarly, H.R. 5393 does not specify allocations within RRA, but House report language does specify funding levels for three programs: \$171 million for EPSCoR; \$48 million for the International Ocean Drilling Program (IODP); and \$147 million for “NSF’s contributions to the Brain Research through Advancing Innovative Neurotechnologies (BRAIN) initiative,” which are part of NSF’s Understanding the Brain (UtB) cross-foundation investment.

Both the House and Senate reports note support for NSF’s peer review process. The House report further directs agency actions regarding research abstracts, including a continuation of agency efforts to ensure that award abstracts are written in “plain English,” stating that they “serve as a public justification for NSF funding decisions by articulating how the project serves the national interest.”

**Table 2. NSF Funding by RRA Subaccount, FY2015-FY2017**  
(budget authority in millions of dollars)

Account	FY2015 Enacted	FY2016 Estimate	Request	FY2017		
				House Committee- Reported	Senate Committee- Reported	Enacted
<b>Biological Sciences (BIO)</b>	<b>736.2</b>	<b>744.2</b>	<b>790.5</b>	<b>n/s</b>	<b>n/s</b>	
<i>Discretionary</i>	736.2	744.2	745.7	–	–	
<i>Mandatory</i>	0	0	44.8	–	–	
<b>Computer and Information Science and Engineering (CISE)</b>	<b>933.0</b>	<b>935.8</b>	<b>944.8</b>	<b>n/s</b>	<b>n/s</b>	
<i>Discretionary</i>	933.0	935.8	938.4	–	–	
<i>Mandatory</i>	0	0	56.4	–	–	
<b>Engineering (ENG)</b>	<b>923.5</b>	<b>916.2</b>	<b>1002.7</b>	<b>n/s</b>	<b>n/s</b>	
<i>Discretionary</i>	923.5	916.2	946.4	–	–	
<i>Mandatory</i>	0	0	56.3	–	–	
<b>Geosciences (GEO)</b>	<b>1319.0</b>	<b>1318.5</b>	<b>1398.8</b>	<b>n/s</b>	<b>n/s</b>	
<i>Discretionary</i>	1319.0	1318.5	1319.6	–	–	
<i>Mandatory</i>	0	0	79.3	–	–	
<b>Mathematical and Physical Sciences (MPS)</b>	<b>1376.3</b>	<b>1349.2</b>	<b>1436.5</b>	<b>n/s</b>	<b>n/s</b>	
<i>Discretionary</i>	1376.3	1349.2	1355.1	–	–	



Account	FY2015 Enacted	FY2016 Estimate	FY2017			
			Request	House Committee- Reported	Senate Committee- Reported	Enacted
<i>Mandatory</i>	0	0	81.4	–	–	
<b>Social, Behavioral, and Economic Sciences (SBE)</b>	<b>276.2</b>	<b>272.2</b>	<b>288.8</b>	<b>n/s</b>	<b>n/s</b>	
<i>Discretionary</i>	276.2	272.2	272.4	–	–	
<i>Mandatory</i>	0	0	16.4	–	–	
<b>Office of International Science and Engineering (OISE)</b>	<b>48.5</b>	<b>49.1</b>	<b>52.1</b>	<b>n/s</b>	<b>n/s</b>	
<i>Discretionary</i>	48.5	49.1	49.1	–	–	
<i>Mandatory</i>	0	0	3.0	–	–	
<b>International and Integrative Activities (IIA)</b>	<b>427.5</b>	<b>447.1</b>	<b>459.9</b>	<b>n/s</b>	<b>n/s</b>	
<i>Discretionary</i>	427.5	447.1	451.3	–	–	
<i>Mandatory</i>	0	0	8.6	–	–	
<b>U.S. Arctic Research Commission (USARC)</b>	<b>1.4</b>	<b>1.4</b>	<b>1.4</b>	<b>n/s</b>	<b>n/s</b>	
<i>Discretionary</i>	1.4	1.4	1.4	–	–	
<i>Mandatory</i>	0	0	0	–	–	
<b>Research and Related Activities (RRA) Total</b>	<b>6041.6</b>	<b>6033.7</b>	<b>6425.4</b>	<b>6079.4</b>	<b>6033.6</b>	
<i>Discretionary</i>	6041.6	6033.7	6079.4	6079.4	6033.6	
<i>Mandatory</i>	0	0	346.0	0	0	

**Source:** FY2017 NSF Budget Request to Congress; H.R. 5393 as reported by the House Committee on Appropriations, and H.Rept. 114-605; and S. 2837, as reported by the Senate Committee on Appropriations, and S.Rept. 114-239.

**Notes:** The term “n/s” means “not specified.” Totals may not add due to rounding.

## Education and Human Resources (EHR)

The President’s FY2017 budget request includes \$953 million for EHR, a \$73 million (8.3%) increase over the FY2016 estimate. Of the total, \$54 million is requested as mandatory budget authority. As reported by the Senate and House Committees on Appropriations, both S. 2837 and H.R. 5393 would keep EHR funding at the FY2016 enacted level by providing \$880 million in discretionary funding and no mandatory funding.

Within EHR, there are four divisions: Division of Graduate Education (DGE), Division of Undergraduate Education (DUE), Division of Human Resource Development (HRD), and Division of Research on Learning in Formal and Informal Settings (DRL). The FY2017 request includes increases over FY2016 for each division, the largest of which are requested for DRL (\$249.3 million total, an 11.9% increase) and DGE (\$305.3 million total, a 9.6% increase). New mandatory funding is requested for each division except for DGE.

By program, the largest increase in the FY2017 EHR budget request is for EHR Core Research (ECR): STEM Learning, within DRL.<sup>6</sup> The FY2017 request for ECR: STEM Learning is \$52 million (including \$9 million in requested mandatory funding), double the FY2016 estimate of \$26 million. Congress did not fund a similar requested increase for FY2016. The Senate and House reports do not specify an appropriations amount for DRL or its ECR program.

NSF's budget justification states that "overall, there are no significant shifts in EHR's priorities between FY2016 and FY2017," and notes that EHR will intensify its engagements and cross-discipline collaborations. One of the ongoing EHR priority programs is CyberCorps: Scholarships for Service, for which the President requested \$70 million, an increase of \$20 million over the FY2016 estimate (40% increase). The Senate report recommends \$55 million for this program (10% increase); the House report does not specify an amount.

The President requested no change in total funding for several EHR programs including

- Advancing Informal STEM Learning (AISL, \$63 million—no change in total, but \$8 million of the \$63 million is requested as mandatory funding),
- STEM+C Partnerships (\$52 million—no change in total, but \$31 million of the \$52 million is requested as mandatory funding),
- Advanced Technological Education (ATE, \$66 million),
- Robert Noyce Teacher Scholarship Program (\$61 million),
- Louis Stokes Alliance for Minority Participation (LSAMP, \$46 million),
- Historically Black Colleges and Universities Undergraduate Program (HBCU-UP, \$35 million), and
- Tribal Colleges and University Program (TCUP, \$14 million).

The Senate report recommends funding these programs at the requested level using only discretionary funds. The House report specifies not less than the requested levels for ATE, LSAMP, HBCU-UP, and TCUP. Additionally, the Senate and House reports recommend \$5 million and \$30 million, respectively, to establish a broadening participation program in STEM fields at Hispanic Serving Institutions (HSIs).

## **Major Research Equipment and Facilities Construction (MREFC)**

The Major Research Equipment and Facilities Construction (MREFC) account supports large construction projects and scientific instruments. The Administration seeks just over \$193 million for MREFC in FY2017, \$7 million less than FY2016 (3.6% decrease). The Senate report recommends increasing MREFC funding to \$247 million (\$54 million above the request). The House report recommends decreasing funding to \$87 million (\$106 million below the request).

The budget request would support continued construction of the Large Synoptic Survey Telescope (LSST, \$67 million requested, 32.7% decrease) and Daniel K. Inouye Solar Telescope

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<sup>6</sup> Each EHR division has an EHR Core Research program (ECR). ECR: STEM Learning is in the Division of Research on Learning in Formal and Informal Settings (DRL). According to the October 24, 2014, ECR: Fundamental Research in STEM Education program solicitation (NSF15-509), DRL's "ECR projects are grounded in theory, ask well formulated research questions, employ relevant data and analytic techniques, and contribute to the growing body of literature on STEM education research." Other ECRs include in DGE, ECR: STEM Professional Workforce Preparation; in HRD, ECR: Broadening Participation and Institutional Capacity in STEM activity; and in DUE, ECR: STEM Learning Environments.

(DKIST, \$20 million requested, no change).<sup>7</sup> The Senate report recommends funding these activities at the requested level. The House report also recommends funding at the requested level for the LSST (\$67 million); it further directs NSF to provide quarterly briefings to the committee on the status of DKIST but does not specify a funding amount.

The budget request includes \$106 million to begin the construction of two Regional Class Research Vessels (RCRVs) to support science in U.S. coastal waters. The Senate report would increase funding to \$159 million to support the construction of three new RCRVs; the House report does not discuss this program.

The House report states that the “recommendation fully funds the requested amounts for the Antarctic Infrastructure Modernization for Science program” (AIMS, \$5 million requested for preconstruction planning).<sup>8</sup>

Both the Senate and House reports would also direct the Government Accountability Office (GAO) to provide an independent perspective on the technical risks and cost overruns for MREFC programs. The National Ecological Observatory Network (NEON) is transitioning from the construction phase to the operational phase, and NSF reports that construction is expected to be complete by the end of FY2017. Consequently, no MREFC funding is requested for NEON, and NSF requests \$65 million through the Research and Related Activities account for ongoing operations and maintenance costs for the project.

## **Other Accounts and Initiatives**

The Administration seeks \$373 million for the Agency Operations and Award Management (AOAM) account, a \$43 million (13%) increase over FY2016. A multi-year plan to relocate NSF headquarters accounts for \$34 million of this increase. The Senate report recommends \$330 million (same as FY2016). The House report recommends \$340 million (\$10 million above FY2016).

The budget request would fund the National Science Board (NSB) and the Office of Inspector General (OIG) at approximately the same levels as in FY2016 (\$4 million and \$15 million, respectively). The House and Senate reports recommend similar levels.

The FY2017 request also includes funding for three multi-agency initiatives.<sup>9</sup> NSF activities under the National Nanotechnology Initiative (NNI) would receive \$415 million, about the same as in FY2016.<sup>10</sup> The Networking and Information Technology Research and Development (NITRD) program activities would receive \$1.254 billion, an increase of \$59 million (4.9%).<sup>11</sup> Most of the NITRD increase (\$56 million) is requested as new mandatory funding. Activities under the U.S. Global Change Research Program would receive \$348 million, which is \$9 million

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<sup>7</sup> The Advanced Technology Solar Telescope was renamed the Daniel K. Inouye Solar Telescope in December 2013.

<sup>8</sup> AIMS is part of NSF’s broader activities to increase U.S. operational efficiency in the Antarctic (\$23.5 million total requested), implementing recommendations from the U.S. Antarctic Program Blue Ribbon Panel report, *More and Better Science in Antarctica Through Increased Logistical Effectiveness*, Washington, DC, July 2012, available at [https://www.nsf.gov/geo/plr/usap\\_special\\_review/usap\\_brp/rpt/index.jsp](https://www.nsf.gov/geo/plr/usap_special_review/usap_brp/rpt/index.jsp).

<sup>9</sup> See the National Science and Technology Council (NSTC) activities under the “NSF-Wide Investments” section of the NSF FY2017 budget request, pp. 82, 87, and 94, as well as the “Summary Tables” section, p. 9.

<sup>10</sup> For more information on the NNI program, see CRS Report RL34401, *The National Nanotechnology Initiative: Overview, Reauthorization, and Appropriations Issues*, by (name redacted)

<sup>11</sup> For more information on the NITRD program, see CRS Report RL33586, *The Federal Networking and Information Technology Research and Development Program: Background, Funding, and Activities*, by (name redacted)

(2.6%) more than the FY2016 estimate.<sup>12</sup> The Senate and House reports do not include recommendations for these initiatives.

## Authorizations of Appropriations

Authorizations of appropriations to NSF, which were last enacted in the America COMPETES Reauthorization Act of 2010 (P.L. 111-358), expired in FY2013.<sup>13</sup> Members of the 114<sup>th</sup> Congress have introduced measures to reauthorize provisions from P.L. 111-358, including provisions that would authorize appropriations to NSF.

As reported by the Senate Committee on Commerce, Science, and Transportation on June 29, 2016, S. 3084, the American Innovation and Competitiveness Act, would authorize \$7.510 billion for NSF in FY2017. As passed by the House in 2015, H.R. 1806, the America COMPETES Reauthorization Act of 2015, would authorize \$7.597 billion for NSF in FY2017, specifying funding levels for major accounts and RRA subaccounts.<sup>14</sup>

Each of these proposed acts would provide reduced authorizations of appropriations compared to the FY2013 NSF authorization levels under P.L. 111-358. Compared to NSF budget amounts, the proposed reauthorization levels are higher than NSF’s actual and estimated budget amounts in FY2015 and FY2016. **Table 3** shows the FY2013 authorization levels, appropriations to NSF in FY2015 and FY2016, FY2017 requested amounts, and proposed authorized funding levels for NSF in FY2017 under selected reauthorization measures from the 114<sup>th</sup> Congress.

**Table 3. NSF Appropriation Authorizations Under Selected, Proposed Reauthorization Acts**  
(in millions of dollars)

Account	FY2013 Authorized	FY2015 Actual	FY2016 Estimate	FY2017 Request <sup>a</sup>	Proposed Reauthorization Acts <sup>b</sup>		
					S. 3084	H.R. 1806	H.R. 1898
<b>Research and Related Activities (RRA)</b>	6,637.8	6,041.6	6,033.7	6,425.4	n/s	6,186.3	6,495.6
<i>Biological Sciences (BIO)</i>	n/s	736.2	744.2	790.5	n/s	823.0	n/s
<i>Computer and Information Science and Engineering (CISE)</i>	n/s	933.0	935.8	944.8	n/s	1,038.0	n/s
<i>Engineering (ENG)</i>	n/s	923.5	916.2	1002.7	n/s	1,010.0	n/s
<i>Geosciences (GEO)</i>	n/s	1319.0	1318.5	1398.8	n/s	1,200.0	n/s
<i>Mathematical and Physical Sciences (MPS)</i>	n/s	1376.3	1349.2	1436.5	n/s	1,500.0	n/s

<sup>12</sup> For more information on FY2016 federal R&D funding, including the multi-agency NNI, NITRD, and USGCRP initiatives, see CRS Report R43944, *Federal Research and Development Funding: FY2016*, coordinated by (name redacted)

<sup>13</sup> See CRS Report R43880, *The America COMPETES Acts: An Overview*, by (name redacted)

<sup>14</sup> Additionally, H.R. 1898, the America Competes Reauthorization Act of 2015, would authorize \$8.099 billion for NSF in FY2017, specifying funding levels by major account. Of the three proposed reauthorization acts, only H.R. 1898 would provide funding at or above NSF’s FY2017 request. H.R. 1898 was introduced on April 21, 2015, and Congress took no further action on the bill.

Account	FY2013 Authorized	FY2015 Actual	FY2016 Estimate	FY2017 Request <sup>a</sup>	Proposed Reauthorization Acts <sup>b</sup>		
					S. 3084	H.R. 1806	H.R. 1898
<i>Social, Behavioral, and Economic Sciences (SBE)</i>	<i>n/s</i>	276.2	272.2	288.8	<i>n/s</i>	150.0	<i>n/s</i>
<i>Office of International Science and Engineering (OISE)</i>	<i>n/s</i>	48.5	49.1	52.1	<i>n/s</i>	38.5	<i>n/s</i>
<i>Integrative Activities (IA)</i>	<i>n/s</i>	427.5	447.1	459.9	<i>n/s</i>	425.3	<i>n/s</i>
<i>U.S. Arctic Research Commission (USARC)</i>	<i>n/s</i>	1.4	1.4	1.4	<i>n/s</i>	1.5	<i>n/s</i>
<b>Education and Human Resources (EHR)</b>	1,041.8	886.3	880.0	952.9	<i>n/s</i>	866.0	1,010.7
<b>Major Research Equipment and Facilities Construction (MREFC)</b>	236.8	144.8	200.3	193.1	<i>n/s</i>	200.3	200.0
<b>Agency Operations and Award Management (AOAM)</b>	363.7	306.6	330.0	373.0	<i>n/s</i>	325.0	372.6
<b>National Science Board (NSB)</b>	4.9	4.2	4.4	4.4	<i>n/s</i>	4.4	4.5
<b>Office of the Inspector General (OIG)</b>	15.0	14.6	15.2	15.2	<i>n/s</i>	15.2	15.6
<b>NSF, Total</b>	<b>\$8,300.0</b>	<b>\$7,398.0</b>	<b>\$7,463.5</b>	<b>7964.0</b>	<b>\$7,510.0</b>	<b>\$7,597.1</b>	<b>\$8,099.0</b>

**Source:** America COMPETES Reauthorization Act of 2010 (P.L. 111-358); FY2017 NSF congressional budget justification; S. 3084, as reported by the Senate Committee on Commerce, Science, and Transportation on June 29, 2016; H.R. 1806, as passed by the House on May 20, 2015; and H.R. 1898, as introduced on April 21, 2015.

**Notes:** The term “n/s” means “not specified.” Amounts in the “FY2015 actual” column represent total, actual budgetary resources, including annual appropriations, unobligated balances, transfers, and other adjustments. Italicized account names represent RRA subaccounts.

- Amounts include both discretionary and new mandatory funding requests. See **Table 1** and **Table 2** for a breakdown of discretionary and mandatory funding requests for NSF major accounts and RRA subaccounts.
- These acts may include proposed reauthorizations for more than one fiscal year. This table only includes FY2017 proposed reauthorization amounts.

## NSF Funding History

The following sections provide information on authorizations of appropriations, as well as funding data and trends, since the foundation was established in 1950.

### Long-term Funding Trends

**Table 4**, **Figure 1**, and **Figure 2** show the trends in NSF authorizations, budget requests, and appropriations since the foundation was first authorized in the early 1950s. Except in FY1957, current and constant dollar actual appropriations to NSF grew rapidly between FY1951 and FY1966. After FY1967, appropriations fluctuated (up some years and down in others) until about FY1988. NSF experienced periods of generally sustained growth in current and constant dollar appropriations between FY1989 and FY1995 and again between FY1998 and FY2003. Since FY2004, growth in the NSF budget has slowed compared to prior years.

**Table 4. NSF Authorizations, Budget Requests, and Appropriations: FY1951-FY2017**  
(in millions of current and constant [FY2017] dollars)

Fiscal Year	Current (\$ millions)			Constant (FY2017 \$ millions)		
	Authorization	Request	Appropriation	Authorization	Request	Appropriation
1951	such sums	—	0	such sums	—	2
1952	such sums	14	4	such sums	107	27
1953	such sums	15	5	such sums	113	36
1954	such sums	15	8	such sums	111	59
1955	such sums	14	14	such sums	103	105
1956	such sums	31	53	such sums	223	381
1957	such sums	41	40	such sums	286	277
1958	such sums	65	52	such sums	437	348
1959	such sums	140	138	such sums	927	910
1960	such sums	160	153	such sums	1,046	998
1961	such sums	190	176	such sums	1,223	1,132
1962	such sums	210	263	such sums	1,338	1,678
1963	such sums	358	323	such sums	2,254	2,030
1964	such sums	589	353	such sums	3,664	2,195
1965	such sums	488	420	such sums	2,981	2,569
1966	such sums	530	480	such sums	3,172	2,871
1967	such sums	525	481	such sums	3,049	2,793
1968	such sums	526	495	such sums	2,953	2,779
1969	525	500	400	2,818	2,684	2,147
1970	478	500	440	2,433	2,547	2,241
1971	538	513	513	2,607	2,487	2,487
1972	653	622	622	3,020	2,879	2,879
1973	697	653	649	3,090	2,896	2,879
1974	633	583	579	2,621	2,414	2,400
1975	808	672	764	3,032	2,523	2,868
1976	787	755	715	2,763	2,652	2,511
1977	811	802	776	2,655	2,626	2,541
1978	879	944	863	2,699	2,897	2,649
1979	930	934	911	2,641	2,653	2,588
1980	1,002	1,006	992	2,617	2,629	2,591
1981	1,115	1,148	1,025	2,652	2,732	2,439
1982	n/a	1,354	1,039	n/a	3,014	2,314
1983	n/a	1,073	1,094	n/a	2,289	2,333

Fiscal Year	Current (\$ millions)			Constant (FY2017 \$ millions)		
	Authorization	Request	Appropriation	Authorization	Request	Appropriation
1984	n/a	1,292	1,341	n/a	2,663	2,762
1985	n/a	1,502	1,502	n/a	2,995	2,995
1986	1,517	1,569	1,524	2,958	3,060	2,971
1987	1,685	1,686	1,623	3,214	3,215	3,095
1988	n/a	1,893	1,717	n/a	3,497	3,172
1989	2,050	2,050	1,923	3,642	3,642	3,416
1990	2,388	2,149	2,082	4,095	3,685	3,570
1991	2,782	2,485	2,316	4,607	4,115	3,836
1992	3,245	2,742	2,571	5,246	4,433	4,155
1993	3,505	3,037	2,734	5,534	4,795	4,316
1994	n/a	2,753	2,983	n/a	4,254	4,609
1995	n/a	3,200	3,264	n/a	4,842	4,938
1996	n/a	3,360	3,220	n/a	4,991	4,783
1997	n/a	3,325	3,270	n/a	4,854	4,773
1998	3,506	3,367	3,431	5,055	4,855	4,947
1999	3,773	3,773	3,676	5,372	5,372	5,234
2000	3,886	3,921	3,912	5,421	5,470	5,457
2001	n/a	4,572	4,431	n/a	6,229	6,036
2002	n/a	4,473	4,823	n/a	5,996	6,466
2003	5,536	5,036	5,323	7,283	6,624	7,002
2004	6,391	5,481	5,589	8,203	7,036	7,174
2005	7,378	5,745	5,482	9,183	7,150	6,823
2006	8,520	5,605	5,589	10,269	6,756	6,737
2007	9,839	6,020	5,890	11,546	7,065	6,912
2008	6,600	6,429	6,125	7,587	7,391	7,042
2009	7,326	6,854	6,494 <sup>a</sup>	8,325	7,789	7,379 <sup>a</sup>
2010	8,132	7,045	6,873	9,161	7,936	7,742
2011	7,424	7,424	6,806	8,197	8,197	7,514
2012	7,800	7,767	7,033	8,457	8,421	7,626
2013	8,300	7,373	6,884	8,847	7,859	7,338
2014	n/a	7,626	7,172	n/a	7,992	7,517
2015	n/a	7,255	7,344	n/a	7,502	7,594
2016	n/a	7,724	7,463	n/a	7,862	7,597
2017	n/a	7,964	—	n/a	7,964	—

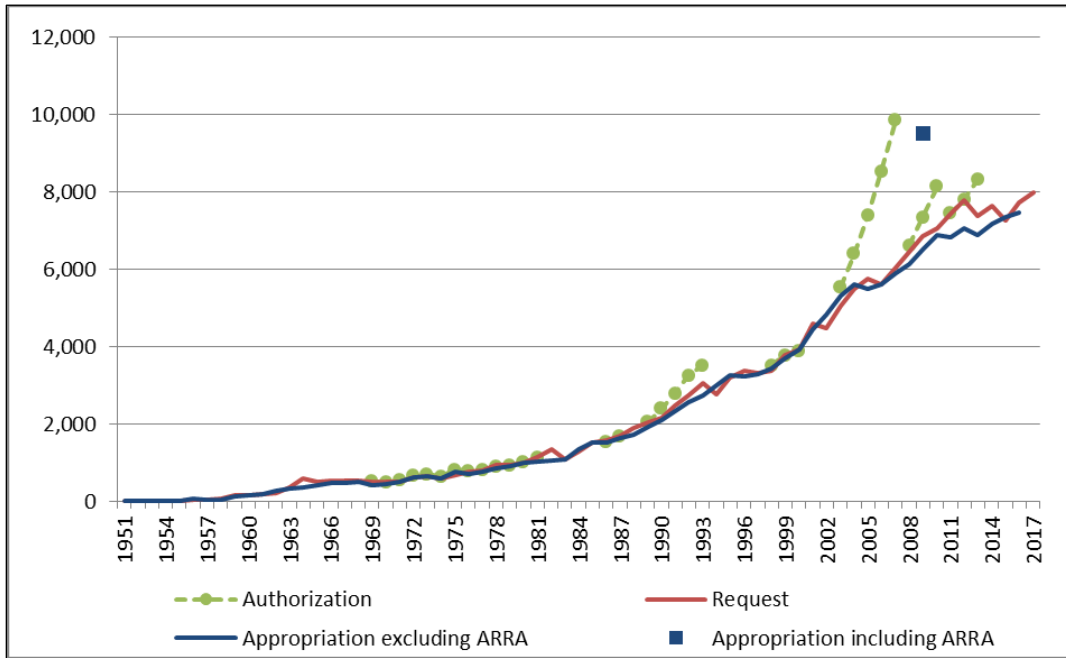


**Source:** Funding data in the “Authorization” columns are from selected FY1951 to FY2013 NSF authorization acts. Funding data in the “Request” and “Appropriations” columns are from National Science Foundation, Budget Internet Information System, “NSF Requests and Appropriations History,” NSF.gov, June 13, 2016, <http://dellweb.bfa.nsf.gov/NSFRqstAppropHist/NSFRequestsandAppropriationsHistory.pdf>. To calculate constant FY2017 dollars, CRS used the Gross Domestic Product (Chained) Price Index found in Office of Management and Budget, *Historical Tables*, “Table 10.1,” February 2, 2016, available at <http://www.whitehouse.gov/sites/default/files/omb/budget/fy2017/assets/hist10z1.xls>.

**Notes:** As per communication between CRS and NSF dated March 20, 2014, the “Appropriation” column shows funding provided in annual appropriations acts plus adjustments required in those acts, other laws, committee reports, etc. Adjustments include rescissions, sequestration, funding transfers across NSF accounts, supplemental appropriations (not including American Recovery and Reinvestment Act, P.L. 111-5, funding in FY2009), and other changes. Resulting amounts most closely align with NSF’s approved Current Plans. The term “n/a” means “not available.” The term “such sums” means “such sums as may be necessary” to carry out agency powers and duties.

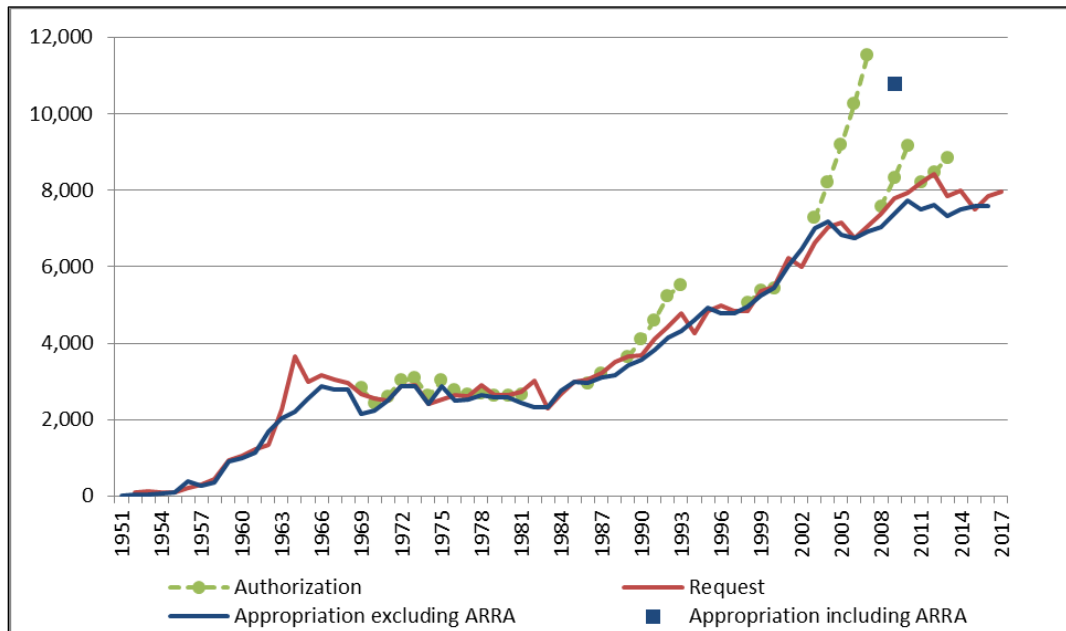
- a. FY2009 appropriation amounts do not include American Recovery and Reinvestment Act (ARRA), P.L. 111-5, supplemental funding, which provided an additional \$3,002 million to NSF. With ARRA included, total FY2009 appropriations to NSF were \$9,496 million in current dollars and \$10,791 million in constant (FY2017) dollars.

**Figure 1. Current Dollar NSF Authorizations, Budget Requests, and Appropriations: FY1951 to FY2017 Request**  
(in millions of current dollars)



Source: Table 4.

**Figure 2. Constant Dollar NSF Authorizations, Budget Requests, and Appropriations: FY1951 to FY2017 Request**  
(in millions of constant [2017] dollars)



Source: Table 4.

## NSF Obligations by Major Account

**Table 5** shows NSF obligations by major account since FY2003. Prior years are not comparable due to changes in NSF account structure. Most of the growth in total NSF obligations since FY2003 has accrued to the main research account, RRA, which increased by about \$1.890 billion in current dollars (45.6%) between FY2003 and the FY2016 estimate. Total NSF obligations increased by about \$2.094 billion (39%) during this same period.

**Table 5. NSF Obligations by Major Account, FY2003-FY2016**  
(in millions of current dollars)

Fiscal Year	RRA	EHR	MREFC	AOAM	NSB	OIG	NSF Total
2003	4,144	846	179	189	3	9	5,369
2004	4,388	850	184	219	2	9	5,652
2005	4,328	750	165	223	4	10	5,481
2006	4,449	700	234	247	4	11	5,646
2007	4,758	696	166	248	4	12	5,884
2008	4,853	766	167	282	4	12	6,084
2009 <sup>a</sup>	5,152	846	161	294	4	12	6,469
2010	5,615	873	166	300	4	14	6,972
2011	5,608	861	125	299	4	14	6,913
2012	5,758	831	198	299	4	14	7,105
2013	5,559	835	196	294	4	14	6,902
2014	5,775	832	200	306	4	14	7,131
2015	6,042	886	145	307	4	15	7,398
2016 <sup>b</sup>	6,034	880	200	330	4	15	7,463

**Source:** FY2005 to FY2017 annual NSF congressional budget justifications.

**Notes:** NSF adopted its current appropriations account structure in 2003. For this table, CRS adjusted FY2003 to FY2007 RRA and EHR obligations data to reflect the transfer of the EPSCoR program between these accounts in FY2008. This table treats EPSCoR as part of RRA for all years in the data set.

- a. FY2009 appropriations amounts do not include American Recovery and Reinvestment Act (ARRA), P.L. 111-5, one-time supplemental funding. With ARRA included, FY2009 appropriations were \$9,496 million (\$3,002 supplemental) total for NSF; 7,686 million (\$2,500 million supplemental) for RRA; \$945 million (\$100 million supplemental) for EHR; \$552 million (\$400 million supplemental) for MREFC; and \$14 million (\$2 million supplemental) for OIG.
- b. Estimated funding level, as per NSF's FY2017 budget request to Congress. All other years are actual.

## Policy Implications

Continuing appropriations acts (often known as continuing resolutions [CRs]) that provide short-term funding until appropriations decisions are finalized can lead to uncertainty for agencies.<sup>15</sup> On one hand, CRs allow for ongoing appropriations discussions without a funding gap. On the other hand, they may lead to reductions or delays in agency operations, such as hiring staff, beginning new projects, and granting awards and contracts. Further, the CR in effect through December 9, 2016—roughly the first 10 weeks of FY2017—reduces NSF operations slightly below FY2016 estimated levels due to a 0.496% across-the-board decrease from FY2016 funding levels.

In the longer term, differences between program authorizations and appropriations, and a lack of consensus between some House and Senate Appropriations Committee recommendations, may lead to planning challenges for agencies and the broader scientific community. For example, the COMPETES acts sought to double funding for NSF; while the NSF budget increased between FY2008 and FY2013, appropriations did not reach authorized levels. For FY2017, there is a distinct difference between House and Senate recommended funding levels for the major facilities (MREFC) account; such discrepancies in recommendations may reflect broader policy disagreements. Having a clear signal from Congress on likely budgetary resources may better aid future program planning.

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<sup>15</sup> See CRS Report RL34700, *Interim Continuing Resolutions (CRs): Potential Impacts on Agency Operations*, by (name redacted).

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