

## [First Look: National Institute of Standards and Technology Reauthorization Act of 2018 \(HR 6229, 115th Congress\)](#)

Reauthorizes programs conducted by the National Institute of Standards and Technology as well as establishes continued support for quantum information science and artificial intelligence research investments.

Updated last **August 3, 2018**

for the 06/26/2018 version on HR 6229.



### WHAT IT DOES

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[HR 6229](#) Reauthorizes programs conducted by the [National Institute of Standards and Technology](#) (NIST) as well as establishes continued support for quantum information science and artificial intelligence research investments.

For 2018, a total of \$1,198,500,000 is allocated by the [Department of Commerce](#) for NIST programs with \$724.5M allocated for scientific and technical research initiatives, \$319M for the construction and maintenance of NIST facilities, \$140M for the [Manufacturing Extension Partnership Program](#) (outlined in the National Institute and Standards Act, [15 U.S.C. 278k](#)), and \$15M for the [Network for Manufacturing Innovation Program](#) (also outlined in the National Institute and Standards Act, [15 U.S.C. 278s](#)).

For 2019, a total of \$1,115,000,000 is allocated by the Department of Commerce for NIST programs with \$109.9M for advanced communications, networks, and scientific data systems missions; \$103.2M for cybersecurity and privacy missions; \$234M for fundamental measurements and quantum science missions; \$89.8M for physical infrastructure and resilience missions; \$120M for the construction and maintenance of facilities; \$140M for the Manufacturing Extension Partnership program; and \$5M the Network for Manufacturing Innovation Program.

Regarding quantum information sciences, NIST is directed to collaborate with other relevant Federal agencies to continue supporting and expanding quantum science research endeavors and training. NIST is also authorized to establish new partnerships, funding opportunities, and centers promoting quantum science research. Within a year of this bill's passing, NIST will convene a workshop of relevant quantum science stakeholders to discuss on-going opportunities, challenges, and progress in quantum science research. This workshop will also assess NIST's efforts in quantum science as well the progress of the National Quantum Initiative Program (proposed in the National Quantum Initiative Act, [S 3143](#) and [HR 6227](#)). Funding for these efforts will be provided by the Department of Commerce for up to \$80M through FY 2019.

Also included among the initiatives within this bill is the directive that NIST continue to support the Nation's advancement of artificial intelligence research and technology. Specifically, NIST is directed to expand its own endeavors in artificial intelligence research and development as well as develop standard metrics of safety and reliability of artificial intelligence systems research and development nationwide.

### RELEVANT SCIENCE

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While traditional computers rely on storing and reading information in binary bits, [quantum computers](#) make use of new understandings of quantum mechanics that allow information to be read and stored exponentially faster and simultaneously on non-binary quantum bits or "qubits". While quantum computing can exponentially increase the abilities of single computers,

advancement in high-performance computing enables the simultaneous application of multiple sets of computers, called “clusters”, to solve problems. Both quantum and high-performance computing allow for faster and more efficient problem solving, however these new capabilities could also be applied to nefarious uses that will have to be guarded against.

Most of the progress seen in AI has been considered “narrow,” having addressed specific problem domains like playing games, driving cars, or recognizing faces in images. In recent years, AI applications have surpassed human abilities in some narrow tasks, and rapid progress is expected to continue, opening new opportunities in critical areas such as health, education, energy, and the environment. This contrasts with “general” AI, which would replicate intelligent behavior equal to or surpassing human abilities across the full range of cognitive tasks. Experts involved with the [National Science and Technology Council \(NSTC\) Committee on Technology](#) believe that it will take decades before society advances to artificial “general” intelligence.

Ultimately, success in the discrete AI research domains could be combined to achieve generalized intelligence, or a fully autonomous “thinking” robot with advanced abilities such as emotional intelligence, creativity, intuition, and morality. Such autonomous agents could open new ethical and legal complications that will need to be adequately assessed and planned for. For instance, autonomous agents or programs may, as a product of their autonomy, operate outside the expectations of their creators. In the event that the agent or program’s creators have not implemented comprehensive stop gaps, the agent or program may inadvertently cause unintended harm to allies or adversaries. Whether the creators of the agents or programs are liable for any harms, and whether the harms should be given the same status of acts of war, is yet to be determined.

#### STATUS

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Bill HR 6229 was first introduced in the House on June 26, 2018 and subsequently referred to the [House Committee on Science, Space, and Technology](#). On June 27, 2018, the bill was considered, marked up, and ordered to be reported by the House Committee on Science, Space, and Technology.

#### SPONSORS

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Sponsor: [Representative Barbara Comstock](#) (R-VA-10)

#### Cosponsors:

- 8 Republicans
- 2 Democrats

#### PRIMARY AUTHOR

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#### RECOMMENDED CITATION

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Duke SciPol, “First Look: National Institute of Standards and Technology Reauthorization Act of 2018 (HR 6229, 115th Congress)” available at <http://scipol.duke.edu/content/first-look-national-institute-standards-and-technology-reauthorization-act-2018-hr-6229#overlay-context=user> (08/3/2018).

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