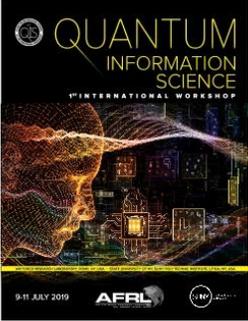
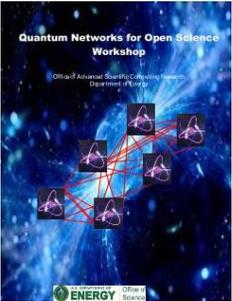
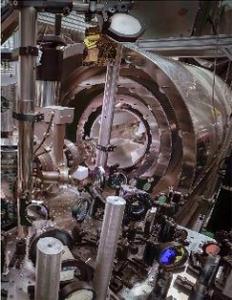
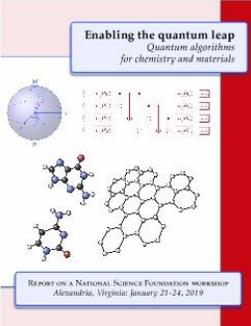
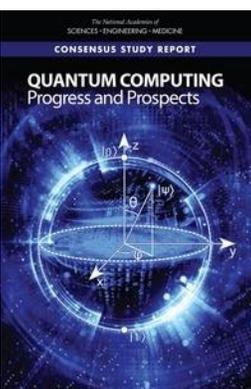


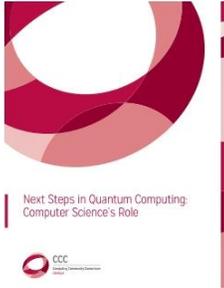
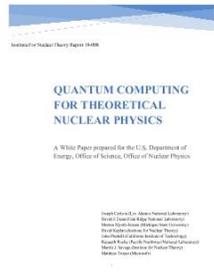
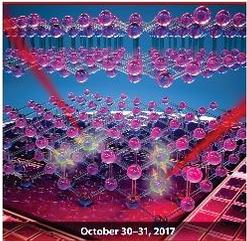
# QIS WORKSHOP & STUDY REPORTS

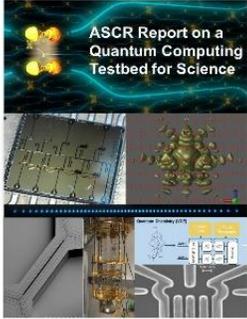
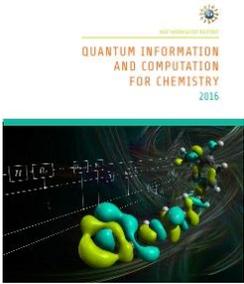
Updated 05.13.2020 for the NQCO.  
Draft Bibliography starts on pg. 9, after the Table.

|    | Cover page  | Title & clickable link   | Lead  | Year |
|----|---|--|-------|------|
| 37 |    | <b><u>Manipulating Quantum Systems: An Assessment of Atomic, Molecular, and Optical Physics in the United States (2019)</u></b><br><br>AMO 2020 Decadal Survey           | NASEM | 2019 |
| 36 |   | <b><u>Quantum Simulators: Architectures and Opportunities</u></b><br><br>NSF Convergence-accelerator workshop report on quantum simulation                               | NSF   | 2019 |
| 35 |  | <b><u>Quantum Computer Systems for Scientific Discovery</u></b><br><br>NSF Convergence-accelerator workshop report on quantum computing                                  | NSF   | 2019 |
| 34 |  | <b><u>Development of Quantum InterConnects for Next-Generation Information Technologies</u></b><br><br>NSF Convergence-accelerator workshop report on quantum networking | NSF   | 2019 |

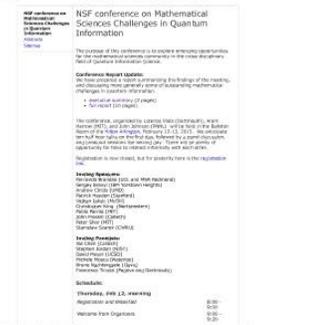
|    | Cover page  | Title & clickable link   | Lead                 | Year        |
|----|---|--|----------------------|-------------|
| 33 |    | <b><u>NSAC QIS subcommittee report</u></b>   | <b>DOE &amp; NSF</b> | <b>2019</b> |
| 32 |    | <b><u>AFRL QIS 1st International Workshop</u></b><br><br><u>(2019 Workshop link)</u>                                 | <b>AFRL</b>          | <b>2019</b> |
| 31 | <thumbnail>   | <b><u>Defense Science Board Report on Applications of Quantum Technologies</u></b>                                   | <b>DOD DSB</b>       | <b>2019</b> |
| 30 |  | <b><u>Quantum Networks for Open Science Workshop Report</u></b><br><br><u>(2018 Workshop link)</u>                   | <b>DOE</b>           | <b>2019</b> |
| 29 |  | <b><u>Opportunities for Nuclear Physics &amp; Quantum Information Science</u></b><br><br><u>(2018 Workshop link)</u> | <b>DOE</b>           | <b>2019</b> |

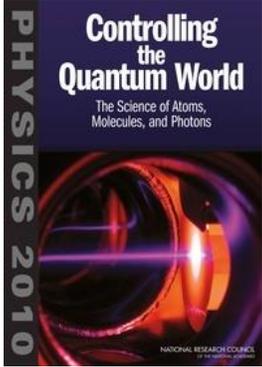
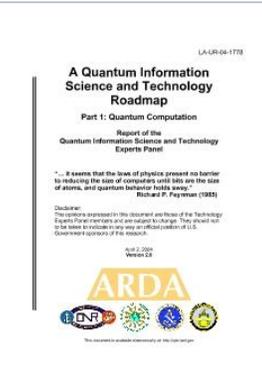
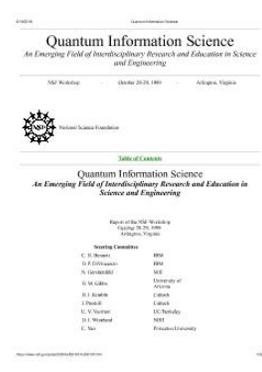
|    | Cover page  | Title & clickable link  | Lead               | Year |
|----|---|---|--------------------|------|
| 28 |   | <b><u>Post Quantum Cryptography Mitigation Workshop</u></b>                                       | CCC / NSF          | 2019 |
| 27 |    | <b><u>2019 NSF workshop on Quantum Algorithms</u></b><br><br><b><u>(Workshop report link)</u></b> | NSF                | 2019 |
| 26 |   | <b><u>NIST.SP.1234 ROI Unleashing Innovation</u></b>  | NIST               | 2019 |
| 25 |  | <b><u>NASEM 2019 Report on Quantum Computing: Progress and Prospects</u></b>                      | National Academies | 2019 |

|    | Cover page  | Title & clickable link  | Lead       | Year |
|----|---|---|------------|------|
| 24 |    | <b><u>Catalyzing Industry-University Collaboration in Quantum Technologies</u></b>  | NSF / UDIP | 2018 |
| 23 |    | <b><u>CCC 2018 workshop: Next Steps in Quantum Computing: Computer Science's Role</u></b><br><br><b><u>(workshop link with resources)</u></b> | CCC / NSF  | 2018 |
| 22 |   | <b><u>2018 NSF workshop on Quantum Biology</u></b>  | NSF        | 2018 |
| 21 | <thumbnail>   | <b><u>Fusion Energy Sciences QIS Roundtable</u></b>   | DOE FES    | 2018 |
| 20 |  | <b><u>Quantum Computing for Theoretical Nuclear Physics, INT report for DOE SC NP</u></b>   | DOE        | 2017 |
| 19 |  | <b><u>2017 DOE BES Opportunities for basic research for next-generation quantum systems (link)</u></b>  | DOE BES    | 2017 |

|    | Cover page   | Title & clickable link   | Lead        | Year |
|----|--|--|-------------|------|
| 18 |  <p>Basic Energy Sciences Roundtable<br/>Opportunities for Quantum Computing<br/>in Chemical and Materials Sciences<br/>October 31 - November 1, 2017</p> | <b><u>2017 DOE BES Opportunities for quantum computing in chemical and material sciences</u></b> | DOE BES     | 2017 |
| 17 |  <p>QUANTUM INFORMATION SCIENCE<br/>Factual Document for the<br/>Office of Basic Energy Sciences<br/>at the Department of Energy<br/>October 15, 2017</p> | <b><u>2017 DOE BES QIS factual document</u></b>  | DOE BES     | 2017 |
| 16 |  <p>ASCR Report on a<br/>Quantum Computing<br/>Testbed for Science</p>  | <b><u>2017 DOE ASCR Report on a Quantum Computing Testbed for Science</u></b>                    | DOE<br>ASCR | 2017 |
| 15 |  | <b><u>2017 NSF workshop on Quantum Communication</u></b>   | NSF         | 2017 |
| 14 |  <p>QUANTUM INFORMATION<br/>AND COMPUTATION<br/>FOR CHEMISTRY<br/>2016</p>  | <b><u>2016 NSF workshop report: Quantum information and computation for chemistry</u></b>        | NSF<br>CHE  | 2016 |

|    | Cover page  | Title & clickable link   | Lead          | Year |
|----|---|--|---------------|------|
| 13 |    | <b><u>Future Directions of Quantum Information Processing A Workshop on the Emerging Science and Technology of Quantum Computation, Communication, and Measurement</u></b> | DOD           | 2016 |
| 12 | <thumbnail>   | <b><u>Quantum Materials for Energy Relevant Technology</u></b>   | DOE BES       | 2016 |
| 11 |   | <b><u>2016 NSF workshop report: Midscale Instrumentation for Quantum Materials</u></b>   | NSF           | 2016 |
| 10 |  | <b><u>2016 DOE Roundtable Report: Quantum Sensors at the Intersections of Fundamental Science, Quantum Information Science &amp; Computing</u></b>                         | DOE BES       | 2016 |
| 9  |  | <b><u>Common Problems in Condensed Matter and High Energy Physics, DOE BES and HEP roundtable report</u></b>   | DOE BES & HEP | 2015 |

|   | Cover page  | Title & clickable link   | Lead     | Year |
|---|---|--|----------|------|
| 8 |  <p>ASCR Workshop on Quantum Computing for Science</p> <p>Abstract<br/>This report details the findings of the DOE ASCR Workshop on Quantum Computing for Science that was organized to assess the status of quantum computing, its capabilities, and the potential for its use in a wide range of scientific and engineering applications. The workshop was held at the University of Maryland, College Park, on October 15-16, 2015. The workshop was organized by the DOE ASCR Quantum Computing for Science Program.</p> | <p><b><u>DOE ASCR 2015 workshop on Quantum Computing for Science</u></b></p> <p><b><u>Update PDF</u></b></p> | DOE ASCR | 2015 |
| 7 |  <p>NSF conference on Mathematical Sciences Challenges in Quantum Information</p> <p>Abstract<br/>The purpose of this conference is to explore emerging opportunities for quantum computing and its applications in the mathematical sciences. The conference will focus on the challenges and opportunities in the field of quantum information science and its applications in the mathematical sciences.</p>  | <p><b><u>2015 NSF workshop on Mathematical Challenges in QIS</u></b></p>                                     | NSF DMS  | 2015 |
| 6 |  <p>DOE Study Group Report<br/>Grand Challenges at the Interface of Quantum Information Science, Particle Physics, and Computing</p> <p>Edward Fuchs, Stephen Jordan, Patrick Hayden (co-chairs)<br/>Mikhail Lukin, Juan Maldacena, John Preskill (co-chairs)<br/>Peter Shor, Jacob Taylor, Carl Williams<br/>© January 2010</p>  | <p><b><u>2014 DOE report on QIS and HEP Grand Challenges</u></b></p>   | DOE HEP  | 2014 |
| 5 |  <p>Quantum Information Science Workshop, April 15-16, 2009, Williamsburg, VA</p> <p>Abstract<br/>The workshop on Quantum Information Science (QIS) was held at Williamsburg, Virginia, on April 15-16, 2009. The workshop was organized by the NSF and the DOE. The workshop was held at the Williamsburg Resort and Conference Center.</p>   | <p><b><u>2009 NSF workshop on QIS</u></b></p>  | NSF      | 2009 |

|   | Cover page  | Title & clickable link   | Lead                      | Year        |
|---|---|--|---------------------------|-------------|
| 4 |    | <b><u>NAS Decadal Survey on AMO Science: Controlling the Quantum World</u></b> | <b>National Academies</b> | <b>2007</b> |
| 3 |   | <b><u>A QIST Roadmap (2004)</u></b>  | <b>ARDA</b>               | <b>2004</b> |
| 2 |  | <b><u>1999 NSF workshop on QIS</u></b>   | <b>NSF</b>                | <b>1999</b> |
| 1 | <thumbnail>   | <b><u>Quantum Computing, JSR-95-115 (JASON study)</u></b>                      | <b>JASON</b>              | <b>1996</b> |
|   |   | <b><u>A list of QIS workshops (external link)</u></b>                          |                           |             |

DRAFT

Bibliography of QIS workshop reports:

[37] National Academies of Sciences, Engineering, and Medicine. 2019. "Manipulating Quantum Systems: An Assessment of Atomic, Molecular, and Optical Physics in the United States," Washington, DC: The National Academies Press. <https://doi.org/10.17226/25613>.

<https://www.nap.edu/catalog/25613/manipulating-quantum-systems-an-assessment-of-atomic-molecular-and-optical> [link accessed 01/02/2020]

[36] Altman, Ehud, Kenneth R. Brown, Giuseppe Carleo, Lincoln D. Carr, Eugene Demler, Cheng Chin, Brian DeMarco et al. "Quantum Simulators: Architectures and Opportunities." arXiv preprint arXiv:1912.06938 (2019). <https://arxiv.org/pdf/1912.06938.pdf> [link accessed 01/02/2020]

[35] Alexeev, Yuri, Dave Bacon, Kenneth R. Brown, Robert Calderbank, Lincoln D. Carr, Frederic T. Chong, Brian DeMarco et al. "Quantum Computer Systems for Scientific Discovery." arXiv preprint arXiv:1912.07577 (2019). <https://arxiv.org/pdf/1912.07577.pdf> [link accessed 01/02/2020]

[34] Loncar, Marko, and Michael G. Raymer. "Development of Quantum InterConnects for Next-Generation Information Technologies." arXiv preprint arXiv:1912.06642 (2019). <https://arxiv.org/ftp/arxiv/papers/1912/1912.06642.pdf> [link accessed 01/02/2020]

[33] Nuclear Physics and Quantum Information Science; Report by the NSAC QIS Subcommittee (October 2019). [https://science.osti.gov/-/media/np/pdf/Reports/NSAC\\_QIS\\_Final\\_Nov8\\_2019.pdf?la=en&hash=06A6D34EFF3B16C3A302C9666620561C386B09BA](https://science.osti.gov/-/media/np/pdf/Reports/NSAC_QIS_Final_Nov8_2019.pdf?la=en&hash=06A6D34EFF3B16C3A302C9666620561C386B09BA) [link accessed 01/02/2020]

[32] AFRL 1st International Workshop on Quantum Information Science, (July 2019) <https://www.suny.edu/media/suny/content-assets/documents/research/QIS-2019-BOOKLET.pdf> [link accessed 01/02/2020]

[31] Executive Summary of Defense Science Board Report on Applications of Quantum Technologies, 2019. [https://dsb.cto.mil/reports/2010s/DSB\\_QuantumTechnologies\\_Executive%20Summary\\_10.23.2019\\_SR.pdf](https://dsb.cto.mil/reports/2010s/DSB_QuantumTechnologies_Executive%20Summary_10.23.2019_SR.pdf)

[30] Department of Energy ASCR Workshop Report, "Quantum Networks for Open Science," 2019, <https://info.ornl.gov/sites/publications/Files/Pub124247.pdf> [link accessed 10/12/2019]

[29] Department of Energy Nuclear Physics Workshop Report "Opportunities for Nuclear Physics & Quantum Information Science," 2019, <https://arxiv.org/pdf/1903.05453.pdf> [link accessed 10/12/2019]

[28] Identifying Research Challenges in Post Quantum Cryptography Migration and Cryptographic Agility, Computing Community Consortium (Workshop Report), 2019. <https://cra.org/ccc/wp-content/uploads/sites/2/2018/11/CCC-Identifying-Research-Challenges-in-PQC-Workshop-Report.pdf>

DRAFT

- [27] NSF Workshop Report: "Enabling the quantum leap; Quantum algorithms for chemistry and materials," Bela Bauer, Sergey Bravyi, Mario Motta, and Garnet Kin-Lic Chan, 2019. Workshop site: <https://sites.google.com/view/nsfworkshopquantumleap/>. Report: [https://www.nsf.gov/mps/che/workshops/quantum\\_algorithms\\_for\\_chemistry\\_and\\_materials\\_report\\_01\\_21-24\\_2019.pdf](https://www.nsf.gov/mps/che/workshops/quantum_algorithms_for_chemistry_and_materials_report_01_21-24_2019.pdf)
- [26] NIST Report: Copan, Walter G., et al. "Return on Investment Initiative for Unleashing American Innovation." Special Publication (NIST SP)-1234. 2018. [NIST Green Paper] <https://nvlpubs.nist.gov/nistpubs/SpecialPublications/NIST.SP.1234.pdf> [link accessed 10/12/2019]
- [25] National Academies of Sciences, Engineering, and Medicine. "Quantum computing: progress and prospects." National Academies Press, 2019, <https://www.nap.edu/catalog/25196/quantum-computing-progress-and-prospects> [link accessed 10/12/2019]
- [24] NSF Workshop Report: "Catalyzing Industry-University Collaboration in Quantum Technologies," 2018, University Industry Demonstration Partnership (UIDP), NSF-sponsored Workshop Report, Organizer: Anthony Boccanfuso <https://uidp.org/publication/catalyzing-industry-university-collaboration-in-quantum-technologies-workshop-report/> [link accessed 10/22/2019]
- [23] CCC Workshop Report: Martonosi, Margaret, and Martin Roetteler. "Next Steps in Quantum Computing: Computer Science's Role." 2019, arXiv preprint arXiv:1903.10541; and <https://cra.org/ccc/wp-content/uploads/sites/2/2018/11/Next-Steps-in-Quantum-Computing.pdf> [link accessed 10/10/2019]
- [22] NSF Workshop on Quantum Biology (2018) <http://physicsoflivingsystems.org/workshop-quantum-biology-and-quantum-processes-in-biology/>
- [21] Fusion Energy Sciences Roundtable on Quantum Information Science (Report of an FES Roundtable), Department of Energy Office of Science, 2018. [https://science.osti.gov/-/media/fes/pdf/workshop-reports/FES-QIS\\_report\\_final-2018-Sept14.pdf?la=en&hash=E4BDACCE1E6975AEE8D2B07778A42E8966048275](https://science.osti.gov/-/media/fes/pdf/workshop-reports/FES-QIS_report_final-2018-Sept14.pdf?la=en&hash=E4BDACCE1E6975AEE8D2B07778A42E8966048275)
- [20] DOE Workshop Report: "Quantum Computing for Theoretical Nuclear Physics", 2018, Institute For Nuclear Theory Report 18-008 [http://www.int.washington.edu/PROGRAMS/17-66W/QuantumComputing\\_NUCLEARPHYSICS\\_FINAL\\_pdf.pdf](http://www.int.washington.edu/PROGRAMS/17-66W/QuantumComputing_NUCLEARPHYSICS_FINAL_pdf.pdf) [link accessed 10/12/2019]
- [19] Department of Energy BES Roundtable Report, "Opportunities For Basic Research For Next-Generation Quantum Systems" October 2017. [https://science.osti.gov/-/media/bes/pdf/reports/2018/Quantum\\_systems.pdf?la=en&hash=291099097EBCCFAB99D86F60F62EA061F996424C](https://science.osti.gov/-/media/bes/pdf/reports/2018/Quantum_systems.pdf?la=en&hash=291099097EBCCFAB99D86F60F62EA061F996424C) [link accessed 10/12/2019]

DRAFT

[18] Department of Energy BES Roundtable Report, “Opportunities for Quantum Computing in Chemical and Materials Sciences,” 2017, [https://science.osti.gov/-/media/bes/pdf/reports/2018/Quantum\\_computing.pdf?la=en&hash=C767B23CFFD250A01F846D3B6F962143BEC258B0](https://science.osti.gov/-/media/bes/pdf/reports/2018/Quantum_computing.pdf?la=en&hash=C767B23CFFD250A01F846D3B6F962143BEC258B0) [link accessed 10/12/2019]

[17] Department of Energy BES Quantum information Science references list Factual Document (2017) [https://science.osti.gov/-/media/bes/pdf/reports/2018/QIS\\_Systems\\_Factual\\_Document.pdf?la=en&hash=7D98ADCBC916DFA109C05E2F365B845B120E446D](https://science.osti.gov/-/media/bes/pdf/reports/2018/QIS_Systems_Factual_Document.pdf?la=en&hash=7D98ADCBC916DFA109C05E2F365B845B120E446D) [link accessed 01/02/2020]

[16] Department of Energy “ASCR Report on a Quantum Computing Testbed for Science,” 2017, <https://www.osti.gov/servlets/purl/1470992> [accessed online 10/10/2019]

[15] NSF Workshop on Quantum Communication (2017); Conference Award: [https://www.nsf.gov/awardsearch/showAward?AWD\\_ID=1745810](https://www.nsf.gov/awardsearch/showAward?AWD_ID=1745810); Report: TBA.

[14] NSF Workshop Report: “Quantum Information and Computation for Chemistry,” 2016, NSF Workshop Report, [Jonathan Olson](#), [Yudong Cao](#), [Jonathan Romero](#), [Peter Johnson](#), [Pierre-Luc Dallaire-Demers](#), [Nicolas Sawaya](#), [Prineha Narang](#), [Ian Kivlichan](#), [Michael Wasielewski](#), [Alán Aspuru-Guzik](#) <https://arxiv.org/abs/1706.05413> [link accessed 10/22/2019]

[13] VTARC Report, “Future Directions of Quantum Information Processing A Workshop on the Emerging Science and Technology of Quantum Computation, Communication, and Measurement,” 2016, VTARC Report, Organizers: Seth Lloyd and Dirk Englund, [https://basicresearch.defense.gov/Portals/61/Documents/future-directions/Future\\_Directions\\_Quantum.pdf?ver=2017-09-20-003031-450](https://basicresearch.defense.gov/Portals/61/Documents/future-directions/Future_Directions_Quantum.pdf?ver=2017-09-20-003031-450) [link accessed 10/22/2019]

[12] Quantum Materials for Energy Relevant Technology, (Report of a BES Workshop), Department of Energy Office of Science, 2016. [https://science.osti.gov/-/media/bes/pdf/reports/2016/BRNQM\\_rpt\\_Final\\_12-09-2016.pdf?la=en&hash=E7760711641883FFC9F110D70385937D6A31C64F](https://science.osti.gov/-/media/bes/pdf/reports/2016/BRNQM_rpt_Final_12-09-2016.pdf?la=en&hash=E7760711641883FFC9F110D70385937D6A31C64F)

[11] NSF workshop report: Midscale Instrumentation for Quantum Materials (2016) [https://www.nsf.gov/mps/dmr/MIQM\\_report\\_v15.pdf](https://www.nsf.gov/mps/dmr/MIQM_report_v15.pdf) [link accessed 01/02/2020]

[10] Department of Energy HEP-ASCR QIS roundtable report, “Quantum Sensors at the Intersections of Fundamental Science, QIS and Computing”, 2016, [https://science.osti.gov/-/media/hep/pdf/Reports/DOE\\_Quantum\\_Sensors\\_Report.pdf](https://science.osti.gov/-/media/hep/pdf/Reports/DOE_Quantum_Sensors_Report.pdf) [link accessed 10/12/2019]

[9] Department of Energy HEP-BES roundtable report, “Common Problems in Condensed Matter and High Energy Physics”, 2015, <https://www.osti.gov/servlets/purl/1275474> [link accessed 10/10/2019].

DRAFT

[8] Department of Energy “ASCR Workshop on Quantum Computing for Science”, 2015, SAND2015-5022R, <https://prod-ng.sandia.gov/techlib-noauth/access-control.cgi/2015/155022r.pdf> [link accessed 10/15/2019]

[7] NSF Workshop Report “Mathematical Sciences Challenges in Quantum Information”, 2015, Organizers: Lorenza Viola, Aram Harrow, and John Johnson. <https://sites.google.com/site/mathqinfo2015/home> [link accessed 10/22/2019]

[6] Department of Energy HEP-ASCR Study Group Report, “Grand Challenges at the Interface of Quantum Information Science, Particle Physics, and Computing,” 2015, <https://prod-ng.sandia.gov/techlib-noauth/access-control.cgi/2015/155022r.pdf> [link accessed 10/10/2019].

[5] NSF Workshop Report “Report of the Workshop on Quantum Information Science,” 2009, <http://calyptus.caltech.edu/qis2009/> [link accessed 10/22/2019]

[4] “Controlling the Quantum World, the Science of Atoms, Molecules, and Photons” 2007, NAS Decadal Survey of AMO Science. <https://www.nap.edu/catalog/11705/controlling-the-quantum-world-the-science-of-atoms-molecules-and> [link accessed 10/22/2019]

[3] [ARDA Report] “A Quantum Information Science and Technology Roadmap,” 2004, ARDA Report LA-UR-04-1778 [https://qist.lanl.gov/pdfs/qc\\_roadmap.pdf](https://qist.lanl.gov/pdfs/qc_roadmap.pdf) [link accessed 10/22/2019]

[2] NSF Workshop Report: “Quantum Information Science - An Emerging Field of Interdisciplinary Research and Education in Science and Engineering” (1999) <https://www.nsf.gov/pubs/2000/nsf00101/nsf00101.htm> [link accessed 10/22/2019]

[1] Quantum Computing, JSR-95-115 (JASON study), July 1996. <https://fas.org/irp/agency/dod/jason/qc.pdf>