OFFICE OF SCIENCE ADVISORY COMMITTEE
to the
U.S. DEPARTMENT OF ENERGY

PUBLIC MEETING MINUTES
July 17, 2026

Hybrid Meeting
Capital Hilton, 1001 16th St NW, Washington, DC

DEPARTMENT OF ENERGY OFFICE OF SCIENCE ADVISORY COMMITTEE SUMMARY OF HYBRID MEETING

The U.S. Department of Energy (DOE) Office of Science Advisory Committee (SCAC) convened a hybrid meeting on Friday, July 17, 2026, via Zoom and at the Capital Hilton, 1001 16th St NW, Washington, DC. The meeting was open to the public and conducted in accordance with the requirements of the Federal Advisory Committee Act (FACA). Information about SCAC and this meeting can be found at https://science.osti.gov/About/Federal-Advisory-Committee/SCAC.

SCAC Members Present:

Persis Drell, Chair, Stanford University
Scott DeBoer, Micron Technology
Drew Endy, Stanford University
Cynthia Friend, The Kavli Foundation
Suresh Garimella, University of Arizona
Makoto Gonokami, Riken
Anna Grassellino, Fermi National Accelerator Laboratory (Fermilab)
Supratik Guha, University of Chicago, Argonne National Laboratory (ANL)
Eric Isaacs, Research Corporation for Science Advancement (RCSA)
Lara Jehi, Cleveland Clinic
Pushmeet Kohli, Google DeepMind
Tammy Ma, Lawrence Livermore National Laboratory (LLNL)
Michael Mahoney, University of California, Berkeley; Lawrence Berkeley National Laboratory (LBNL)
Nadya Mason, University of Chicago
Mark Papermaster, Advanced Micro Devices (AMD)
Mayly Sánchez, Florida State University
Martin Schmidt, Rensselaer Polytechnic Institute (RPI)
Edward Seidel, University of Wyoming
David Siegel, Two Sigma
David Spergel, Simons Foundation
A.N. Sreeram, Dow, retired
Derek Sutherland, Realta Fusion

SCAC Members Absent:

None

Designated Federal Officer:

Linda Horton, Associate Deputy Director for Science Programs; Acting Associate Director, Office of Fusion Energy Sciences (FES)

SCAC Committee Manager:

Katie Runkles, Program Analyst for the Deputy Director for Science Programs

Friday, July 17, 2026

Drell, SCAC chair, called the meeting to order at 9:00 a.m. Eastern Time (ET) to an audience of approximately 105 in-person attendees and 247 virtual attendees. The meeting agenda and the SCAC charter were shared. SCAC members introduced themselves.

Perspectives and Vision from the Under Secretary for Science, Darío Gil

Gil stressed the importance of moving quickly to maintain U.S. global leadership in science, citing the National Science Foundation's (NSF) report, *The State of U.S. Science and Engineering*, which was released in May 2026. For the first time, China's gross research and development (R&D) spending has exceeded U.S. expenditures, while producing a greater proportion of the world's scientific publications. Despite that, the U.S. remains the gold standard for high-impact research, generating a disproportionate share of the world's most highly cited articles. Considering this, the Genesis Mission is aimed at amplifying those qualitative advantages by integrating advanced artificial intelligence (AI), automated physical laboratories, and quantum computing to accelerate the pace of scientific discovery.

Fiscal Year 2027 (FY27) budget details for the Office of Science (SC) were shared. The House Mark designates $8.525B, a 3.3% increase over FY26 enacted levels. $3.8B is allocated for facility operations and $1.3B for construction projects, reflecting an approach that aligns with administration priorities while continuing to support foundational research. The Senate Mark is still forthcoming. High-quality and high-value discovery research remain at the core of the SC portfolio, with ~$300M in grants awarded in FY26 and an additional $430M in the negotiations phase. These programs are supported through the diligence of the SC staff, with new personnel actively being hired; 50 roles are in the process of being filled, representing an increase of ~10% of the current workforce, while fifteen critical vacancies have been filled over the past four months.

Coinciding with the "Ushering in the Next Frontier of Quantum Innovation" executive order (EO) issued in June 2026, the Quantum Genesis initiative was established as a core component of the Genesis Mission. This formalizes DOE's commitment to deploy the first fault-tolerant, scientifically relevant quantum computing capability for R&D by 2028. To achieve that goal, Quantum Genesis has set forth three major priorities: the DOE Q Competition, to incentivize breakthroughs through commercial and academic solutions; the National Quantum Supercomputing User Facility, to democratize access to world-class quantum hardware; and focused R&D for quantum computing applications, ensuring that quantum hardware translates into real-world scientific breakthroughs.

The U.S. is not pursuing the Genesis Mission alone; a $1B strategic partnership with Japan was announced in June 2026. This marked the first international partner in the mission, bringing together eleven joint scientific teams across twelve national laboratories, one SC user facility, and twelve Japanese research institutions. These collaborations will span quantum information science (QIS), fusion energy, biotechnology, advanced materials, particle physics, and autonomous laboratory systems.

An update was given on The Genesis Mission: Transforming Science and Energy with AI request for applications (RFA). This interdisciplinary solicitation invited teams to address the National Science and Technology Challenges and closed in May 2026, drawing the largest number of submissions in DOE's history. Thousands of applications were received from industry, national laboratories, and academia, representing all 50 states, Puerto Rico, and Washington, DC. Phase 1 winning projects were scheduled to be announced on July 22 at the Genesis Mission 2026 Summit.

Gil concluded by commending the subcommittees for their diligence in working to address their respective charges. The next 20 years represent a critical period for the SC. The committee members were urged to be mindful of balancing the operation of world-leading facilities with adequate funding for the research grants and experimental programs they support, especially in light of the integration of next-generation tools such as AI.

Discussion

Drell asked for more details about the Genesis Mission partnership with Japan. **Gil** stated that the partnership would span five years, with each party contributing half of the $1B investment toward research infrastructure, projects, and collaborations. Eleven National Science and Technology Challenges were selected as areas for collaboration. These are led on the Japanese side by the Ministry of Education, Culture, Sports, Science and Technology (MEXT) and the Ministry of Economy, Trade and Industry (METI). There is a formal governance structure in place that reflects the seriousness of the partnership. **Gonokami** emphasized the long history of collaboration between DOE and Japan and noted how agentic AI is rapidly changing scientific research. As a result, open science and data policy must be prioritized moving forward.

Papermaster sought insight into the mandate established by the "Ushering in the Next Frontier of Quantum Innovation" EO and how it aligns with the Genesis Mission. **Gil** described the EO as a clear statement on how the U.S. will lead in quantum computing, communications, and sensing. QIS is an indispensable part of the Genesis Mission. It is one of the three computing pillars within the mission: high-performance computing (HPC) for simulation, AI supercomputing for neural network-based approaches, and quantum computing.

Spergel inquired about broader efforts to engage other government agencies in the Genesis Mission. **Gil** said that DOE and the Office of Science and Technology Policy (OSTP) have made significant efforts to position the Genesis Mission as an all-of-government initiative. Participating agencies include NSF, the National Institutes of Health (NIH), and the National Aeronautics and Space Administration (NASA), with additional details expected to be announced at the Genesis Mission 2026 Summit.

Garimella asked about DOE's role in encouraging students at all levels to embrace training related to AI. **Gil** added that one of the mission's pillars focuses on developing talent, beginning with PhD programs. As AI accelerates scientific research, serious consideration should be given to whether PhD programs could be completed within four years instead of six. Similarly, messaging about AI needs to change; students will become better scientists and engineers when they receive training in advanced computing, but that is not currently being communicated effectively.

Sánchez sought advice on how less “flashy” SC facilities, such as modernization projects and national laboratory infrastructure upgrades, might secure funding. **Gil** underscored the importance of SCAC’s role in establishing investment priorities for facilities as part of continuing the SC’s legacy of maintaining world-class facilities.

Friend requested information about the process for choosing international partners for the Genesis Mission beyond Japan. **Gil** outlined three principles for bringing on new international partners: whether a country is a close ally of the U.S. and strategically aligned with the Genesis Mission, has a history of bottom-up collaborations, and demonstrates a willingness to move quickly. Beyond forming partnerships at the country level, partnerships will also be formed with specific international scientific institutions.

Grassellino asked for guidance on how committee members should advocate for balancing the budget between construction projects, facilities operations, and research funding to ensure that research remains relevant. **Gil** noted the long-term trend of facilities receiving a greater share of the budget at the expense of research and encouraged the committee to consider what the appropriate budget ratio between these areas might be. Research should be better supported, but thoughtfully rebalancing the SC portfolio will require transparency about the necessary tradeoffs.

Isaacs inquired about how speed and close collaboration with industry, academia, and the national laboratories can be more effectively normalized within DOE. **Gil** emphasized finding shared purposes and objectives and then making contractual partnerships easier.

Schmidt mentioned the *Fusion Science & Technology (FS&T) Roadmap* and asked about its goals for public-private partnerships, especially in developing novel approaches. **Gil** stated that DOE needs to enable commercialization and provide industry validation in addition to funding research. Shared infrastructure and testing facilities are needed to move towards commercial fusion power plants, and public-private partnerships are a vital part of that effort.

Siegel noted the negative public perception around AI and asked how that narrative can be changed. **Gil** agreed that messaging portraying AI as dangerous and as a cause of job loss is damaging, and that demonstrating AI’s role in solving important scientific and engineering problems will help improve public perception.

Mason asked how collective scientific goals can be reached when there are knowledge gaps that AI cannot address. **Gil** explained that AI is one element of the Genesis Mission, which brings together scientists, staff, facilities, and instrumentation. Collaboration is at the heart of this, with AI serving as a tool to accelerate workflows.

Jehi questioned whether jointly built and operated international facilities might be pursued as a way to relieve pressure between infrastructure and research funding. **Gil** said that infrastructure investments with Japan will benefit both that partnership and the Genesis Mission overall. No single institution has the capabilities needed to operate at a world-class level leveraging AI, so this will need to be addressed structurally, both domestically and with international partners.

Seidel underscored the current rate of technological change and asked what structural changes could be made around items like deliverables and milestones, which hinder scientists' ability to be nimble. **Gil** suggested that a flexible, platform-based approach would allow researchers to easily access resources without long-term, fixed infrastructure commitments, while also supporting short-term funding opportunities that test many ideas, with only the most promising projects receiving larger, long-term investments.

Mahoney asked how talented young researchers can remain engaged and do cutting-edge work instead of being constrained by the rigidity of existing systems. **Gil** noted that these researchers are already piecing together collaborations to gain access to tools despite the barriers; organizations should support mobility and collaboration to reduce those barriers.

Guha inquired whether greater engagement should be encouraged with China to better understand its progress in areas like materials science and microelectronics. **Gil** rejected the notion that the U.S. should be either entirely open or entirely closed when engaging with China, suggesting a tiered approach in which decisions about research disclosure are based on the appropriate risk matrix.

Spergel asked whether earning a PhD could be accelerated to four years. **Gil** stated that this is a current mission focus area, sharing that if four-year PhD programs were implemented at scale, 30% more American scientists with those degrees would be produced over the next decade. This needs to be studied to determine whether it is feasible, but it could represent the start of a rethinking of the American higher education system.

Drell dismissed the meeting at 10:24 a.m. for a break and reconvened the meeting at 10:36 a.m.

Updates from the Genesis Mission Subcommittee, Suresh Garimella (Chair), Pushmeet Kohli, (Vice Chair), Drew Endy, Makoto Gonokami, Michael Mahoney, Nadya Mason, David Siegel, David Spergel

Garimella shared the larger question the subcommittee considered in responding to the Genesis Mission Charge: how the U.S. and its international allies could build a scientific AI capability that fundamentally accelerates discovery and translation across the entire research enterprise for the benefit of humanity. The subcommittee saw this moment as a technological inflection point similar to the advent of electricity, semiconductors, and the internet. If developed and deployed responsibly, AI has the potential to shape the next generation of scientific discoveries for national security, innovation, and economic prosperity.

The Genesis Mission is a national strategy to ensure American leadership through the development of the scientific AI infrastructure, computing capacity, data resources, and partnerships needed to accelerate discovery across disciplines. The mission was described as augmenting scientific research capabilities rather than replacing scientists by enabling exploration of larger design spaces, real-time experimental control, reduced iteration cycles, and the identification of otherwise hidden patterns.

To accomplish this vision, new national scientific infrastructure is needed. Agile, purpose-built, AI-optimized hardware and platforms are required in addition to the national flagship supercomputers and frontier-scale computing systems already in place at DOE national laboratories. DOE was described as uniquely positioned to lead this transformation through its experience, capabilities, partnerships, and mission-driven culture of innovation.

Successful implementation of the Genesis Mission will rely on the three pillars of computing, data, and algorithms. The Genesis Mission platform brings these pillars together and is purpose-built to meet the rigorous requirements of scientific research. The platform will support the development of new classes of AI algorithms that can reason across vast, multimodal data streams and interact seamlessly with physical systems. Researchers will be able to combine AI foundation models, advanced supercomputers, and federated data to accelerate the scientific discovery process.

Garimella concluded by recommending a focus on scientifically relevant challenges that illustrate how Genesis Mission resources could deliver societal and competitive benefits as part of a national innovation ecosystem. This approach requires collaboration, workforce development, transparency, and accountability. Three of these challenges were presented by the subcommittee to exemplify the vision and begin the conversation around additional input needed for the forthcoming report.

Updates from the Genesis Mission Subcommittee: Biological Exemplar, Pushmeet Kohli

Kohli spoke on behalf of the biological exemplar for the Genesis Mission. The vision presented was an AI-powered campaign to make biology more measurable, predictable, and engineerable at digital speed. Deoxyribonucleic acid (DNA) sequencing has outpaced the ability to interpret biology's encoding mechanisms, so the goal is to use AI to predict and design the functions of living systems from their genetic code. Achieving this would have major implications across energy, supply chain resilience, security, health, biodefense, the environment, and other domains. This loop combines biology measurement, modeling, and manufacturing.

The bioeconomy represents $1T globally today and will increase to $30T by 2050; for the U.S. to cement leadership in this area, AI systems must be developed to solve biological problems more cheaply and effectively. DOE is well-positioned to lead this effort because of its existing expertise and resources. The national laboratories, exascale computing resources, synchrotrons, and neutron sources are all components of the potential National Digital Biology Platform, which would enable a nationwide loop of measurement, modeling, and manufacturing.

Examples of potential results from this platform were shared, including the biomanufacturing of new therapeutics, chemicals, and materials, such as jet fuel made from carbon dioxide; the development of new forms of bioenergy, such as optimized ribulose-1,5-bisphosphate carboxylase / oxygenase (rubisCO); resilient feedstocks and food crops; the resolution of structures and dynamics of proteins considered undruggable; and the development of novel pathogens matched to a designed antiviral within 48 hours.

The three pillars of this exemplar were reiterated: AI-enabled measurement, modeling, and manufacturing. Together, these pillars compress the cycle from biological hypothesis to verified production at digital speed, with greater certainty achieved through each iteration of the closed loop.

Endy closed the presentation by highlighting the synergistic and compounding advantages of this AI-powered loop.

Discussion

Friend asked how risks would be evaluated in this context. **Endy** noted that building a platform *de novo* allows for safety and security to be intentionally incorporated from the beginning.

Isaacs inquired about which areas of biology have datasets available for AI training. **Endy** agreed on the need for more data and for discussion around which areas of biology should be included. The areas ready for measurement include predicting and designing ribonucleic acid (RNA) molecules, cell-scale visual proteomics, and cryo-electron tomography (cryo-ET). **Jehi** shared that the subcommittee started with AI-enabled measurement as the pillar most ready for innovation, noting that a genetic sequencing study for a patient takes eight weeks and that more than 50% of the findings are of unknown significance. This is one of many practical challenges that this work can address immediately.

Mason sought input on developing targeted datasets for training AI versus broader datasets that might enable new discoveries. **Endy** shared that the subcommittee would be recommending specific data types, while stressing the need for a mechanism for the biological community to prioritize focused data. World-leading laboratories will be needed to generate high-throughput, high-quality biological data at scale.

Kohli discussed the need for data curation across disparate experiments. Considering the design of datasets in ways that are usable for the training and validation of AI models could be an area that brings the broader biology community together.

Ma mentioned the Critical Assessment of protein Structure Prediction (CASP) for its role in bringing accountability to AlphaFold and asked how it would need to evolve to support the prediction of dynamic structures and new engineered molecules. **Kohli** noted that while CASP has continued to evolve, as problems become more complex, the assessments become increasingly complex as well. The challenge is maintaining consistency, vision, and rigor similar to CASP at a larger scale; this will require the community to come together, which is something DOE can facilitate.

Updates from the Genesis Mission Subcommittee: Fusion Energy Exemplar, David Spergel

Spergel spoke on behalf of the fusion energy exemplar. The history of fusion research was outlined – there have been decades of advances and setbacks, but given the growth in commercial investment in the area, fusion is at a point where AI can be transformative under the Genesis Mission. The challenges are complex and fall into both engineering and scientific areas, with progress in both potentially accelerating tenfold or more through ecosystem-wide AI orchestration. This includes advanced modeling, coordinated data infrastructure, digital twins, and experimental capabilities across international boundaries.

In 2025, global investment in fusion grew to $4.48B, which underlines how much the landscape has changed, as DOE was once the predominant funding source. DOE remains central as the provider of enabling infrastructure, which can be further enhanced through the Genesis Mission. DOE's facilities have produced high-quality experimental and simulation data for many years that can now be leveraged for AI-driven fusion research. Unlike consumer large language models (LLMs), fusion AI systems must operate with relatively sparse datasets, requiring the models to be guided by underlying physics, simulations, scaling laws, and theory. In light of these challenges, DOE must provide the shared infrastructure, data systems, facilities, and coordination that private companies cannot develop independently.

The subcommittee found that if the U.S. does not invest aggressively now, it risks losing technological and manufacturing leadership in fusion. AI can help overcome massive challenges in areas like plasma instabilities and control, material discovery, and power plant design. The current moment was described as well suited for investments in AI through the Genesis Mission to advance these breakthroughs.

Discussion

Drell asked whether there were particular areas or facilities that are most important in having enough data to achieve what was outlined. **Spergel** pointed to the *FS&T Roadmap* as a starting point for answering that question.

Guha stated that, alongside the need for more data, there is a similar need to rethink how experimental synthesis and measurement are conducted. With the current state of research, achieving sufficient throughput for training AI models is not possible, and the SC should be leading the conceptualization around this. **Spergel** expressed doubt about the ability to further accelerate fusion experimental measurements sufficiently but noted that AI can enable the collection of more data from each measurement. The importance of theory and simulation was also underlined as a way to further accelerate progress through scaling laws and symmetry-based data points.

Papermaster inquired about agentic processes and workflows and how they might be leveraged to decrease the time to discovery. **Spergel** agreed that AI agents will allow researchers to achieve much more, but there is the challenge of retraining researchers to operate in this environment.

Isaacs asked about the hype around fusion generated by the private sector and how it might affect progress. **Spergel** cautioned against exaggerated claims regarding fusion progress and encouraged DOE to represent the voice of reason in this area.

Ma raised the point that data must be generated more quickly and that the Genesis Mission will bring current facilities together to identify gaps, which will feed back into these facilities in real time to improve simulations and experiments.

Updates from the Genesis Mission Subcommittee: Magnetic Sovereignty Exemplar, Nadya Mason

Mason spoke on behalf of the magnet sovereignty exemplar, which outlines a five-year mission to rebuild the domestic supply chains and manufacturing capabilities for critical permanent magnets. These magnets are essential for defense, grid security, and manufacturing, and rely on the four rare earth materials of neodymium, praseodymium, dysprosium, and terbium. The U.S. does not have control over any part of the supply chain for these materials, while China dominates this market.

The Genesis Mission will enable progress on a timescale that matches the urgency of this problem, leveraging AI to integrate siloed disciplines, data, and models. By creating an active learning loop that integrates experimental data, autonomous laboratories, the American Science Cloud (AmSC), modeling, and digital twins, the full system can be optimized from ore to product. This aims to reduce timelines for domestic permanent magnet production from decades to years.

The exemplar focuses on three major areas: AI-accelerated materials discovery, AI-driven manufacturing, and AI-enabled domestic materials recovery. Current processes focus only on new materials that can be manufactured at scale and align with reclaiming materials for domestic feedstocks. Within the learning loop, AI can dramatically speed up this process by rapidly testing magnet designs, optimizing manufacturing processes through tools like digital twins and computer vision, and improving recycling and recovery systems using robotics and predictive models. If successful, this would serve as a test case that can be applied to areas such as batteries, semiconductors, catalysts, and structural alloys, revolutionizing entire fields of science and technology.

Discussion

Drell asked about where data would be coming from and where the need for more data is. **Mason** noted the need for targeted data for microstructures from synchrotron facilities, the National High Magnetic Field Laboratory (MagLab), and other laboratories. This data must be integrated at scale across the whole supply chain to solve key problems. **Isaacs** suggested that DOE consider setting data standards for select critical topics.

Friend inquired about manufacturability, sharing that small-scale manufacturing does not move quickly. **Mason** said that by integrating all aspects of the process, AI-driven feedback loops can save time through combined design and optimization.

Mahoney discussed building broad foundation models trained on large datasets that can be adapted to more detailed applications, which can be especially useful when specialized data is limited. There are remaining challenges in combining different scientific datasets and machine learning (ML) methods in this area.

Garimella asked for feedback from the committee around the overall approach presented.

Seidel sought input on how to balance governance and security while still encouraging open collaboration with international partners. **Garimella** agreed with concerns around transparency and accountability, and emphasized the need for formal governance structures in pursuing these partnerships.

Siegel suggested adding information around tangible budget figures.

Sreeram made an offer to provide expertise in high-throughput research for chemistry and materials science based on previous experience at Dow.

Isaacs emphasized that the Genesis Mission must be sustainable over the long-term and integrated into DOE's existing structures to ensure success.

Friend encouraged the subcommittee to think about the scientific infrastructure needed for experimentation and data collection to support the Genesis Mission, especially around costs and potential synergies across projects.

Voting on the Recommendations of the Genesis Mission Subcommittee

Drell initiated the voting process to approve the response shared with the committee regarding the Genesis Mission Charge, noting that the written report would be expected by the end of August with only minor cosmetic edits in response to comments shared by the committee. This vote passed unanimously with 22 'yes' votes.

Drell dismissed the meeting at 12:07 p.m. for lunch and reconvened the meeting at 1:01 p.m.

Updates from the Quantum Information Science Subcommittee, Anna Grassellino (Chair), Supratik Guha (Vice Chair), Eric Isaacs, Lara Jehi, Mark Papermaster, Martin Schmidt

Grassellino shared the subcommittee's progress in responding to the Quantum Charge, which asked for a roadmap identifying near-term steps toward a concrete 2028 goal of an error-corrected quantum computer with sufficient scale to enable revolutionary scientific advances. To do so, the subcommittee solicited community feedback to shape its recommendations through stakeholder interviews and a town hall. Through this process, six findings and associated recommendations emerged.

The first finding was that quantum computing is at a historic inflection point that DOE must embrace, with recent technical advancements making this moment a unique opportunity to develop a new scientific instrument for discovery. Second, scientific utility has become a critical challenge; grand challenges should define the requirements for algorithms, software, hardware, and systems engineering through continuous co-design, rather than adapting applications to existing technologies. Third, DOE is uniquely positioned to lead the next phase of scientific quantum computing because of its world-leading quantum research ecosystem. This includes sustained investments in SC core programs, the National Quantum Information Science Research Centers (NQISRCs), and deep partnerships spanning the national laboratories, universities, industry, and international collaborators. The subcommittee emphasized that DOE should further advance this effort by integrating quantum computing into its broader ecosystem of major scientific instruments.

Fourth, new partnership models and greater openness are essential to accelerate scientific discovery, particularly by lowering the barriers for collaborations between hardware developers and domain scientists and preserving appropriate intellectual property (IP) protections. The fifth finding stressed the importance of continued innovation across the quantum technology stack. DOE has unique capabilities in areas like accelerator science, cryogenics, microelectronics, advanced materials, scientific instrumentation, and user facilities that accelerate industry efforts through co-design partnerships. The final finding was that sustained national commitment and technology diversity will be essential to realize the full opportunity of quantum computing. The subcommittee suggested that DOE should build on its successful investments while maintaining a broad and competitive ecosystem, noting that it remains premature to converge on a single technology pathway. Instead, continued investment across multiple hardware modalities, architectures, and scientific approaches will be necessary.

To support these goals, the subcommittee presented a phased "3x3" roadmap built around three linked tracks: scientific grand challenges to drive capability development, the eventual creation of an integrated DOE quantum computing user facility, and a longer-term future in which quantum computing becomes embedded throughout DOE's broader scientific infrastructure and experimental ecosystem.

Discussion

Spergel asked whether there was a proposed budget split between construction projects, facilities operations, and research funding. **Grassellino** did not have one but recognized that getting that balance right is an existential problem for the SC. **Gil** shared that the percentage of the budget allocated to research was once ~40% of the total but is now closer to ~30% and encouraged SCAC to think deeply about this in a transparent way.

Guha suggested that a future quantum computing user facility will require deep collaboration between the facility staff and expert users, necessitating a modified research funding model that differs from other user facilities.

Seidel advocated for estimating the needed technical capabilities, such as number of qubits and acceptable error rates, for major scientific areas. DOE should deploy a wide range of prototype quantum computers to encourage competition and accelerate innovation. **Grassellino** agreed with these suggestions, noting that the roadmap attempts to connect scientific goals with hardware requirements, although precise predictions are not currently possible. The subcommittee agreed with supporting prototype systems, which would allow for the validation of technologies to be used in a user facility. **Isaacs** emphasized that quantum computers will follow a similar path to synchrotrons and other scientific instruments, where expertise will grow as users get hands-on experience. Different quantum computing platforms may be better suited for different scientific problems, so utilizing these machines is the first step in understanding how a user facility should function. **Papermaster** pointed to the progression of HPC technologies, with more productive systems and collaborations leading to successive phases and specialized computing clusters.

Drell added that broad untargeted research programs might be the first to be cut from budgets, so investments in quantum computing research must be tied to long-term goals to ensure sustainable funding. **Grassellino** agreed but also cautioned against discouraging the type of open-ended research that leads to innovative discoveries.

Jehi shared that feedback the subcommittee received suggesting that quantum computing resources should be extended beyond disciplines that fall into the SC, which could potentially expand the amount of funding available through other government agencies.

Guha said that the current hardware challenges are difficult but solvable, so the biggest opportunities are in identifying relevant scientific problems and working with industry to prioritize these areas. **Grassellino** agreed with the need to take advantage of opportunities for connecting domain scientists with hardware manufacturers.

Mahoney added that ML and AI methods should be viewed as crosscutting scientific infrastructure and considered in the context of quantum computing and the broader discussion of the SC budget. **Grassellino** said that AI and ML were viewed as key components of this effort, especially through leveraging the capabilities enabled through the Genesis Mission. **Mahoney** clarified that many researchers are using commercial AI tools that are not well suited for scientific research, so future scientific AI models should be considered shared infrastructure used across all domains. **Gil** confirmed the vision of considering models and software as infrastructure.

Mason asked how quantum grand challenges and benchmarks might integrate with existing efforts like NSF's Quantum Leap Challenge Institutes (QLCI) and the Defense Advanced Research Projects Agency's (DARPA) Quantum Benchmarking Initiative (QBI). **Grassellino** emphasized that the grand challenges should be part of a flexible framework that evolves as the field advances. **Gil** said that other efforts like QLCI and QBI are complementary and valuable efforts alongside which DOE can deliver actual capabilities in the form of a quantum computer. **Grassellino** confirmed this and reiterated that the subcommittee was focused on delivering a functioning instrument for the community. **Isaacs** noted that the driving force is the DOE mission areas and their experts, but that the technology will quickly become useful more broadly. **Gil** added that DOE's strengths make it best suited to lead quantum computing efforts, but that the vision is to establish interagency partnerships and avoid duplication of scientific infrastructure as much as possible.

Siegel expressed enthusiasm for the existence of multiple pathways toward success in quantum computing and suggested the subcommittee further highlight this. **Grassellino** saw this as a vital part of the roadmap and something that would mobilize a national quantum ecosystem.

Seidel appreciated the framing of the roadmap through scientific applications because it will encourage scientists to propose further applications and problems. **Grassellino** underlined that the applications discussed were meant to be illustrative rather than comprehensive.

Garimella suggested the subcommittee consider presenting information in a way that less technical readers, like congressional staff, can understand, especially regarding the societal benefits that might come from investing in quantum computing. **Grassellino** appreciated the suggestion and explained the efforts made to use less technical language but acknowledged that further changes might need to be made to reach these audiences. **Jehi** agreed that the language should be clearer and more impactful. **Guha** added that the roadmap should be readable but also have rigorous analysis backing its recommendations. **Grassellino** said that more technical information could be put in appendices. **Garimella** noted that the discussion does not need to be less rigorous, only presented more clearly for readers who are not able to read the entire report.

Sutherland observed the parallels between quantum computing and fusion energy, with different technical approaches each carrying different technical risks. The approach of a diverse technical portfolio is a strong value proposition because it reduces the overall risk in reaching the ultimate goal. **Grassellino** said that there was a section in the report addressing risk and gaps that could be strengthened with this feedback.

Friend warned against overstating the standalone capabilities of quantum computing, with applications like designing new fertilizers needing to be validated by real-world experimentation.

Seidel asked whether the subcommittee discussed quantum networking. **Grassellino** noted that the charge was focused on quantum computing but acknowledged the importance of quantum networking for connecting computing facilities and enabling internal communication within large quantum computers. **Isaacs** elaborated on those discussions, adding that networking was mentioned in the context of accessing early machines via the cloud, connecting quantum computers with HPC resources, and linking multiple quantum computers.

Isaacs questioned how the subcommittee might convince policymakers of the value of quantum computing, given that the technology is less mature and more uncertain, without being overly cautious or overpromising its impact. **Gil** underscored that QIS research has strong political support and interest, so the subcommittee should approach this with scientific rigor and balance. The technology is on the cusp of major advancements after decades of research, so conveying that excitement in an objective manner should be sufficient. **Grassellino** pointed to the work presented in the Advanced Scientific Computing Research (ASCR) program's April 2026 *Blueprint for DOE Quantum Supercomputing* report, as well as the statements given by the experts the subcommittee spoke with. **Gil** cautioned against overconfidence among experts regarding how the field will develop, emphasizing the need to remain open to a wide range of possibilities.

Kohli drew parallels in quantum computing to AI, where steady scaling led to major breakthroughs even while scientific applications remained unclear. The subcommittee should emphasize that improvements in hardware would lead to similar breakthroughs even if the outcomes are still undetermined.

Voting on the Recommendations of the Quantum Information Science Subcommittee

Drell initiated the voting process to approve the response shared with the committee regarding the Quantum Charge, noting that the written report would be expected by the end of August with only minor cosmetic edits in response to comments shared by the committee. This vote passed unanimously with 22 'yes' votes.

Drell dismissed the meeting at 2:40 p.m. for a break and reconvened the meeting at 2:52 p.m.

Updates from the SC User Facilities Subcommittee, Persis Drell (Chair), Cynthia Friend, Tammy Ma, Mayly Sánchez, Ed Seidel, A.N. Sreeram, Derek Sutherland

Drell shared the subcommittee's interim progress in responding to the Facilities Charge, noting that, unlike the other two subcommittees, its report would be presented at the November 2026 SCAC meeting. The charge asks the subcommittee to review proposed SC facilities and upgrades, identify gaps, and prioritize the facilities most critical to the nation's needs over the next ten years. This includes considering how the proposed facilities would support the Genesis Mission in areas such as AI, QIS, fusion energy, microelectronics, biotechnology, and discovery science. The subcommittee's analysis focuses on the proposed projects outlined in the *Summaries of Office of Science Facilities Under Construction and Proposed* document, available on the SCAC website, as well as any identified gaps.

In this context, the subcommittee was asked to make recommendations for new facilities and upgrades over the next decade under scenarios in which either \$2B, \$4B, or \$6B would be available. The difficulty of this task was emphasized, particularly because the proposed projects listed total ~\$22B. Their work began by reviewing prioritization reports created by the now-terminated SC federal advisory committees and speaking with their former chairs. The subcommittee has also begun engaging with associate directors from each SC program office and representatives from their user communities. Discussions have already occurred with Biological and Environmental Research (BER), Basic Energy Sciences (BES), High Energy Physics (HEP), and Nuclear Physics (NP), while ASCR and FES discussions were still forthcoming. An open invitation was also extended to national laboratory directors, and a virtual town hall tentatively scheduled for September 17, 2026, to facilitate broader input.

A preliminary rubric for evaluating facilities was shared, providing a framework for the subcommittee's discussions. The rubric included considerations such as maintaining U.S. leadership, accelerating scientific discovery, fostering partnerships, workforce development, project readiness, risk, and relevance to national security. No specific facilities were associated with the rubric; it was presented only to illustrate the subcommittee's process.

Additional points about the subcommittee's progress were also discussed. Because of the nature of the charge, confidentiality was emphasized, and no substantive updates regarding recommendations would be shared before the November SCAC meeting. It was also emphasized that facilities currently under construction would not be delayed to accommodate new projects. The subcommittee intends to clearly justify its recommendations given the difficulty of the task.

Several broader concerns also emerged during the process. Some national laboratories have aging infrastructure that will require investment to ensure safe and successful project delivery. While projects should be executed as quickly as possible to avoid cost increases, the subcommittee suggested that sequencing projects, rather than pursuing too many in parallel, may be preferable. The subcommittee does not anticipate recommending the removal of projects from the proposed facilities list but instead plans to prioritize them for SC consideration. Some projects may require additional R&D before entering construction to better understand their scope and technical risks, which could help avoid future cost overruns and delays. All of the projects under review were noted to be scientifically valuable, but budget constraints mean that not all can be funded within the next decade.

Discussion

Isaacs urged the subcommittee to evaluate facilities from a crosscutting perspective across the SC, not just as standalone projects. The recommendations should start with scientific needs based on community feedback.

Spergel asked whether projects that begin within the ten-year window but conclude afterward would have their costs fully accounted for in the budget, or only the portion spent before 2037. **Drell** said that projects beginning near the end of the next decade will not be considered unless the subcommittee is directed otherwise.

Grassellino inquired whether the definition of a facility was based on a specific funding threshold, recommended using tiered priority groupings rather than strict numerical rankings, and questioned whether limiting recommendations to the existing project list might prevent important new facilities from emerging. **Drell** explained that $100M was the threshold for a facility to be included but welcomed further DOE input on this. It was clarified that projects currently under construction will not be part of the subcommittee's recommendations, only proposed facilities.

Papermaster recommended providing the evaluation criteria to the scientific community ahead of the forthcoming town hall. **Drell** agreed and said participants would receive specific prompts to guide feedback, along with brief opportunities to speak.

Endy asked how the subcommittee could best make recommendations in light of rapidly emerging facility needs, particularly when important new capabilities are not part of the existing project list. **Drell** responded that the committee would further probe which facilities were most critical, noting that the importance of enabling existing facilities with AI capabilities had emerged clearly in earlier discussions and appeared to be at least as significant as some proposed new facilities.

Mason wondered whether it was within the subcommittee's charge to consider long-term research and workforce sustainability in light of the resources that will be directed toward constructing and operating these facilities. **Drell** stated that the subcommittee was not charged with determining how research and facilities budgets should be allocated, but emphasized that the committee was highly aware of concerns about constrained research funding, noting that facilities cannot achieve their scientific potential if students and researchers are not adequately supported to use them.

Friend pointed to a mismatch in timescales between the subcommittee's long-term facility prioritization process and shorter-term opportunities to adapt existing facilities to meet emerging AI-related needs. SCAC should consider how to balance these two different priorities.

Sánchez asked how the subcommittee should account for the growing operational costs of facilities when making its recommendations, suggesting that a more conservative budget approach might be needed to account for those costs. **Gil** said that the subcommittee's work would help inform later decisions about the appropriate balance among construction, facilities, and research funding, but that those decisions would occur through a separate process.

Mahoney stressed the importance of making facilities AI-ready from the outset, noting the difficulties of formatting data in ways usable for machine learning and the significant changes likely to be introduced by agentic AI workflows and automated data pipelines.

Isaacs asked how the subcommittee would gather input from users outside the DOE ecosystem, such as researchers associated with NSF and NIH. **Drell** pointed to the town hall as an opportunity for all users to provide feedback, regardless of how their work is funded.

Isaacs inquired why the funding scenarios of $2B, $4B, and $6B were chosen. **Drell** explained that these numbers were intended to reflect the serious budget constraints. The final recommendations might shift toward slightly higher funding scenarios, but much larger funding levels would not be realistic.

Jehi wondered whether the $22B figure represented both proposed facilities and existing commitments. **Drell** confirmed that it covered only proposed facilities. The list of facilities was compiled in March 2026 and includes items such as a quantum computing user facility, although the subcommittee would still need to consider other projects that were not included.

Public Comment

None

Drell adjourned the meeting at 3:27 p.m.

Respectfully submitted on August 7, 2026,
Drew Nitschke
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