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Request for Information: Development of a 2025 National Artificial Intelligence Research and Development Strategic Plan

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Comment on FR Doc # 2025-07332

Submitter Information

Organization: Radical AI, Inc.

General Comment

Radical AI respectfully submits these comments in response to the Request for Information (RFI) on the Development of a 2025 National Artificial Intelligence Research and Development Strategic Plan, issued by the Networking and Information Technology Research and Development National Coordination Office on behalf of the Office of Science and Technology Policy (OSTP). The Administration's vision for a "Golden Age of American Innovation" and the imperative to "secure America's preeminence in critical and emerging technologies," as articulated by OSTP Director Michael Kratsios, provides the framework for the nation's R&D priorities. The pursuit of the "Golden Age" compels the identification and exploitation of truly transformative technologies. The 2025 National AI R&D Strategic Plan must, therefore, recognize and strategically invest in AI-driven materials innovation as a foundational pillar for U.S. technological leadership, national security, and sustained economic competitiveness.

Advanced materials are the bedrock of American innovation. America's progress has been consistently forged by our mastery over the physical world, with new materials as keystones for each leap forward. Now, Artificial Intelligence offers the power to amplify this inherent American ingenuity, accelerating the ability to conceive and create novel materials that will define the next era and scale the nation's capacity to build what comes next. The capacity to deploy novel materials at least twice as fast as today underpins innovation across all sectors. This submission proposes that AI offers an unprecedented opportunity to scale American ingenuity by overcoming longstanding bottlenecks in materials R&D, aligning directly with the RFI's aim to "accelerate AI-driven innovation, enhance U.S. economic and national security, promote human flourishing, and maintain the United States' dominance in AI."

The Materials Genome Initiative catalyzed substantial progress in accelerating materials discovery, fueling large open-source datasets, advanced experimentation, and advanced foundation models to expand our known materials from mere hundreds to millions.² However, this advancement is critically undermined by systemic inefficiencies that threaten to cede our competitive edge. Fragmentation across agencies results in siloed infrastructure, data, and models, rendering vital information unusable or inaccessible due to bureaucratic impediments. Concurrently, for the billions of materials identified through AI or simulation, a viable pathway to large-scale manufacturing is largely absent, with critical processing data often lost within the current experimental materials science paradigm that prioritizes successful outcomes. This hinders the ability to rapidly translate discovery into application, a crucial element in maintaining America's technological preeminence – one that typically takes 20 years.

To surmount these obstacles and secure America's leadership in materials R&D, a decisive, strategic approach is imperative. First, the United States must establish clear national materials priorities, directly responsive to the technological demands identified by our nation's leadership, ensuring focused effort on areas of strategic importance. For far too long, the U.S. has waited for a materials problem to become prohibitive before we started working on a solution, an approach guaranteed to slow development. Rather, the U.S. must have novel, scaled materials that propels the U.S. forward - unlocking capabilities industry has yet to imagine. The invention of the transistor was not a response to a demand for improved semiconductors. Instead, the transistor's advent allowed the private sector to innovate in semiconductor technology, leading to the transformative era known as the Silicon Age and resulting in U.S. technological superiority. Secondly, there is an urgent need for a robust national data infrastructure, designed to integrate these national priorities and rapidly disseminate R&D requirements to both public and private entities, thereby dismantling existing silos and fostering accelerated, collaborative innovation. Finally, the establishment of materials or industry-tailored pilot manufacturing facilities is essential to accelerate the scale-up of promising new materials, bridging the critical gap between discovery and deployment and ensuring that American ingenuity translates into tangible economic and national security advantages.

This aligns with the RFI's core objectives, promising a quantum leap in innovation and unlocking over \$100 billion in annual economic value.³ An AI-for-materials action plan will forge a uniquely American engine of innovation, securing our materials future and illuminating AI's potential to revolutionize other critical domains, ensuring the 21st century is unequivocally an American century.

Attachments

Radical AI - Comment on Development of a 2025 National Artificial Intelligence Research and Development Strategic Plan



Date: May 29, 2025

To: Faisal D'Souza, NCO
National Science Foundation
Alexandria, VA

From: Joseph F. Krause
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Comment on the Development of a 2025 National Artificial Intelligence (AI) Research and Development (R&D) Strategic Plan – Seizing the Materials Revolution with AI

Radical AI respectfully submits these comments in response to the Request for Information (RFI) on the Development of a 2025 National Artificial Intelligence Research and Development Strategic Plan, issued by the Networking and Information Technology Research and Development National Coordination Office on behalf of the Office of Science and Technology Policy (OSTP). The Administration's vision for a "Golden Age of American Innovation" and the imperative to "secure America's preeminence in critical and emerging technologies," as articulated by OSTP Director Michael Kratsios, provides the framework for the nation's R&D priorities.¹ The pursuit of the "Golden Age" compels the identification and exploitation of truly transformative technologies. The 2025 National AI R&D Strategic Plan must, therefore, recognize and strategically invest in AI-driven materials innovation as a foundational pillar for U.S. technological leadership, national security, and sustained economic competitiveness.

Advanced materials are the bedrock of American innovation. America's progress has been consistently forged by our mastery over the physical world, with new materials as keystones for each leap forward. Now, Artificial Intelligence offers the power to amplify this inherent American ingenuity, accelerating the ability to conceive and create novel materials that will define the next era and scale the nation's capacity to build what comes next. The capacity to deploy novel materials at least twice as fast as today underpins innovation across all sectors. This submission proposes that AI offers an unprecedented opportunity to scale American ingenuity by overcoming longstanding bottlenecks in materials R&D, aligning directly with the RFI's aim to "accelerate AI-driven innovation, enhance U.S. economic and national security, promote human flourishing, and maintain the United States' dominance in AI."

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hundreds to millions.² However, this advancement is critically undermined by systemic inefficiencies that threaten to cede our competitive edge. Fragmentation across agencies results in siloed infrastructure, data, and models, rendering vital information unusable or inaccessible due to bureaucratic impediments. Concurrently, for the billions of materials identified through AI or simulation, a viable pathway to large-scale manufacturing is largely absent, with critical processing data often lost within the current experimental materials science paradigm that prioritizes successful outcomes. This hinders the ability to rapidly translate discovery into application, a crucial element in maintaining America's technological preeminence – one that typically takes 20 years.²

These structural deficiencies directly translate into delays for the technologies of the future and slow our economic dynamism, representing a significant loss in potential. As America strives to lead in an era of intense global competition, particularly with strategic rivals like the PRC which are aggressively advancing their own materials capabilities, such impediments to translating research breakthroughs into market-ready innovations cannot be ignored. The failure to streamline the journey from discovery to production means forfeiting the prosperity and security that American-led materials innovation promises for future generations.

To surmount these obstacles and secure America's leadership in materials R&D, a decisive, strategic approach is imperative. First, the United States must establish clear national materials priorities, directly responsive to the technological demands identified by our nation's leadership, ensuring focused effort on areas of strategic importance. For far too long, the U.S. has waited for a materials problem to become prohibitive before we started working on a solution, an approach guaranteed to slow development. Rather, the U.S. must have novel, scaled materials that propels the U.S. forward - unlocking capabilities industry has yet to imagine. The invention of the transistor was not a response to a demand for improved semiconductors. Instead, the transistor's advent allowed the private sector to innovate in semiconductor technology, leading to the transformative era known as the Silicon Age and resulting in U.S. technological superiority. Secondly, there is an urgent need for a robust national data infrastructure, designed to integrate these national priorities and rapidly disseminate R&D requirements to both public and private entities, thereby dismantling existing silos and fostering accelerated, collaborative innovation. Finally, the establishment of materials or industry-tailored pilot manufacturing facilities is essential to accelerate the scale-up of promising new materials, bridging the critical gap between discovery and deployment and ensuring that American ingenuity translates into tangible economic and national security advantages.

² Ball, D. W. (2025, March). The Future of Materials Science: AI, Automation, and Policy Strategies (Policy Brief). Mercatus Center, George Mason University. 2

³ Troy Scott, Amanda Walsh, Benjamin Anderson, Alan O'Connor, Gregory Tassey, High-tech infrastructure and economic growth: The Materials Genome Initiative, *Science and Public Policy*, Volume 48, Issue 5, October 2021, Pages 649–661, <https://doi.org/10.1093/scipol/scab042>



Scaling American ingenuity, advancing principled U.S. materials leadership, and pursuing key national capabilities offer a pathway to revolutionize advanced materials R&D. This aligns with the RFI's core objectives, promising a quantum leap in innovation and unlocking over \$100 billion in annual economic value.³ Seizing this opportunity demands bold, sustained federal leadership and investment to catalyze transformation where industry alone cannot suffice. An AI-for-materials action plan will forge a uniquely American engine of innovation, securing our materials future and illuminating AI's potential to revolutionize other critical domains, ensuring the 21st century is unequivocally an American century.

About Radical AI

Radical AI is dedicated to pioneering the application of advanced artificial intelligence to accelerate the discovery, development, and deployment of next-generation materials. Our mission is to enable a civilization that is materially unlocked in its pursuit of humanity's most important ambitions. By building a new scientific process that is multi-disciplinary in nature, Radical AI is accelerating materials research and development and driving new materials discoveries that will solve the most important problems in the world. Radical AI is committed to accelerating scientific ingenuity for the advancement of America's most critical technologies.