DECLARATION OF DR. JUSTIN SCHWARTZ

I, Justin Schwartz, declare as follows:

1. I am the Chancellor at the University of Colorado Boulder ("CU Boulder" or "the University") in Boulder CO. I have held this position since July 1st, 2024. Prior to holding this position, I was Executive Vice President and Provost at The Pennsylvania State University (interim then permanent) from 2022-2024, after serving as the Harold and Inge Marcus Dean of Penn State's College of Engineering from 2017 to 2022. I have spent my career as a researcher, educator, entrepreneur and academic leader in large state universities. I hold a bachelor's degree in nuclear engineering from the University of Illinois Urbana-Champaign and a doctorate in nuclear engineering from the Massachusetts Institute of Technology. I am a fellow of the National Academy of Inventors, the American Association for the Advancement of Science, the Institute of Electrical and Electronics Engineers, and ASM International.

2. As the Chancellor, I have personal knowledge of the contents of this declaration or have knowledge of the matters based on my review of information and records gathered by CU Boulder personnel and could testify thereto.

3. CU Boulder receives substantial annual funding from the Department of Defense ("DOD"). In fiscal year 2024, we received 127 awards for a total of $28,725,592 ($22,062,667 direct costs, $6,662,925 indirect costs) in funding from DOD.

4. CU Boulder intends to apply for new DOD funding awards, and/or renewals and continuations of existing funding awards, in the next year and in future years to come.

5. As of June 13, 2025, CU Boulder has 48 pending grants and cooperative agreements proposals. This is a $58M total award funding request ($44.5M in direct costs, $13.5M in indirect costs). These proposals were budgeted on the understanding that our negotiated indirect cost reimbursement rates would apply. In the ordinary course, CU Boulder would expect DOD to take action on these pending proposals over the next several months. At an indirect cost recovery rate of 15%, the proposed total indirect cost recovery of $13.5M would be reduced by $9.9M to $3.6M. Estimating based on CU Boulder's 32.9% acceptance rate for federal proposals, this change would result in $3.2M less in indirect cost recovery to be

used by CU Boulder to fund its indirect costs of supporting DOD research. The newly-announced DOD indirect cost reimbursement policy is irrational because universities like CU Boulder and other types of institutions often compete for awards under the same DOD programs, and yet the policy applies only to university awardees.

6. The 15% rate cap will make many, if not all, of CU Boulder's proposed research projects infeasible and places CU Boulder in a difficult position. If CU Boulder submits proposals at its negotiated indirect cost rate, as budgeted and as it believes it is entitled to do, it runs a risk of having DOD refuse to fund them and losing the ability to conduct critical research that would be supported by the proposal. On the other hand, if CU Boulder were to submit proposals at the unilaterally imposed 15% rate, it would be committing to conduct and support research based on a financially unsustainable model.

7. The funding CU Boulder receives from DOD supports critical and cutting-edge research vital to our nation's security that also often has benefits for American business by accelerating innovation in sectors such as aerospace, telecommunications, cybersecurity, and advanced manufacturing. Additionally, DOD-funded research strengthens the national STEM workforce, enhances U.S. technological competitiveness, and fosters public-private partnerships that extend beyond defense applications. Millions of Americans benefit from and depend on this research. For example:

a. CU Boulder's *Center for National Security Initiatives* conducts DOD-funded research that strengthens national defense through advancements in geospatial modeling, and space operations. Additional projects investigate terrain stability in Arctic regions for geospatial intelligence and readiness and pursue innovation in high-performance materials for satellites and hypersonic in support resilient space assets and high-speed defense platforms in contested domains.

b. DOD-sponsored research at CU Boulder's *Renewable and Sustainable Energy Institute* (RASEI) supports materials science in critical areas such as chiral spintronics and interface engineering, secure energy-efficient electronics and next-generation sensing technologies vital for defense applications. This includes investigations into organic

semiconductors, which offer potential for lightweight, flexible, and low-cost electronic systems suitable for deployable sensors, wearable devices, and disposable electronics—capabilities aligned with emerging defense needs in mobility, stealth, and environmental resilience.

c. CU Boulder's *Department of Computer Science* advances artificial intelligence algorithms and applications, human-machine collaboration through research focused on optimizing team dynamics between humans and autonomous systems. These projects enhance adaptability and decision-making in complex environments, enabling the development of mission-capable human-robot teams for contested defense scenarios.

d. CU Boulder's *Department of Mechanical Engineering* conducts DOD-sponsored research in non-destructive inspection of advanced material systems and system diagnostic for autonomous systems and robotics, diagnostic tools for hypersonic propulsion, adaptive combustion modeling, granular material impacts, and quantum sensing. These efforts improve weapons systems, aerospace performance, and battlefield sensing, contributing to the reliability and adaptability of next-generation defense platforms.

e. *CU Boulder's Department of Electrical, Computer and Energy Engineering* supports DOD-funded projects advancing critical innovation in photonics and quantum systems, power electronics, advanced signal processing, RF communications, integrated circuits and systems, artificial intelligence and data science, Specifically, research in ultrafast optics, superconducting qubits, and frequency combs enhances secure communications, electronic warfare capabilities, and electromagnetic spectrum dominance for strategic surveillance and command operations.

f. CU Boulder's *Department of Aerospace Engineering Science* contributes to national security through research in space domain awareness, hypersonics, space operations,

and secure satellite operations. Its portfolio includes spacecraft behavior prediction in cislunar space, ionospheric modeling, and aerothermochemistry—all enabling U.S. technological superiority in space surveillance, missile defense, and safe asset deployment in contested environments.

g. At CU Boulder's *Laboratory for Atmospheric and Space Physics* (LASP), DOD-funded research improves atmospheric modeling and space weather forecasting. By advancing understanding of tropical cyclone intensification, radiation-cloud interactions, and solar-induced atmospheric changes, these projects bolster military readiness and infrastructure resilience in the face of severe environmental disruptions.

h. DOD-funded research in the *Physics Department* and at JILA, a joint institute between CU Boulder and NIST, supports quantum sensing, timekeeping, secure communications, and photonic systems vital to defense and economic security. Projects include ultra stable optical clocks, scalable ion entanglement, and quantum transduction—all advancing deployable quantum technologies essential for secure navigation, detection, and strategic superiority in the quantum domain.

i. CU Boulder's *Institute for Cognitive Science* (ICS) conducts interdisciplinary groundbreaking research on artificial intelligence in support of education and of the enhancement of human perception, brain-machine interface, human performance, psychology, and the investigation of brain function towards the improvement of physiological resilience under extreme conditions. Studies on traumatic brain injury-related sleep disruption and immune responses to high-pressure environments support cognitive readiness and performance in high-stress operational settings, while advances in neuroimaging and AI contribute to human-machine systems capable of decision-making under duress.

j. Researchers at CU Boulder's *Cooperative Institute for Research in Environmental Sciences* (CIRES) conduct DOD-aligned work in space weather sensing, magnetic

navigation, and oceanic acoustic scene analysis. These capabilities are critical to operational continuity in GPS-denied or degraded environments, enhancing infrastructure protection, maritime awareness, and navigational resilience in contested theaters.

8. Reimbursement of CU Boulder's indirect costs is essential for supporting this research. The DOD's proposal to cut indirect cost rates to 15% for new awards would end or seriously jeopardize research projects like those described in paragraph 7, as would a 15% rate cap on renewals and/or existing awards.

9. Indirect costs include purchasing and maintaining research equipment (including service contracts), constructing and maintaining state-of-the-art facilities, laboratories and other facilities such as shock tubes, wind tunnels, and laser-based flow diagnostics for hypersonic vehicle research; cleanrooms and cryogenic laboratories for quantum sensing and photonics; advanced neuroimaging platforms including EEG, fNIRS, and fMRI for human performance studies; and satellite operations centers and field-deployable instrumentation for space and environmental remote sensing, and autonomous vehicles and robotics facilities. These facilities support several critical projects funded by the DOD, including several Multidisciplinary University Research Initiatives (MURI) projects discussed below. Without this critical infrastructure, we simply cannot conduct the research.

10. For example, with respect to the areas of research described in Paragraph 7:

a. The *Center for National Security Initiatives* (NSI) draws on CU Boulder's high-performance computing resources and materials testing labs to support geospatial modeling, satellite resilience, and hypersonic materials research. This includes the 2022 MURI project on Hypersonics, titled *"Realizing and Controlling Hypersonic Shock and Turbulence Interactions via Rarefaction Effects,"* which leverages the university's shock tube facility, high-speed imaging systems, and laser-based flow diagnostics to experimentally investigate boundary layer and shock interactions under hypersonic conditions. In parallel, the 2023 MURI titled "*Chemical and Microbial*

Indicators of Permafrost Degradation" utilizes CU's field-deployable environmental monitoring systems, molecular biology labs, and climate modeling platforms to analyze terrain stability and biogeochemical signals across Arctic regions. Both projects are supported by CU's high-performance computing clusters and advanced simulation tools, enabling modeling across atmospheric, geophysical, and fluid dynamic domains central to national defense.

b. RASEI researchers use thin-film deposition systems, ultrahigh vacuum equipment, and scanning probe microscopy to study electronic materials relevant to secure and energy-efficient defense technologies.

c. Computer science projects leverage the campus's high-performance computing clusters and AI development environments, including GPU-accelerated systems used for real-time modeling and simulation of autonomous systems and human-machine teaming. This includes resources supporting the 2023 MURI on *"Cognitive Security and Its Mitigation,"* which involves real-time neurophysiological monitoring and human-subject experimental platforms.

d. In engineering, key facilities include high-speed wind tunnels, a shock tube lab, and combustion diagnostics labs for studying propulsion and impact physics relevant to hypersonics and survivability. These facilities also support the 2024 MURI on *"Control of Hypersonic Flows by Phononic Subsurfaces,"* which will establish a new paradigm for passive manipulation of air flow over hypersonic vehicles using phononic subsurfaces to delay laminar-to-turbulent transitions, thereby reducing drag and surface temperatures.

e. The *Colorado Nanofabrication Lab* includes cleanroom facilities that host ultrafast optics labs, and cryogenic testbeds used for research quantum sensing, secure communications, and frequency comb development. For example, The 2024 MURI on

"*Passive Heterodyne Photodetection of Incoherent Broadband Sources"* utilizes CU's precision metrology and laser stabilization infrastructure.

f. Aerospace Engineering's facilities support autonomous flight testing, plasma diagnostics labs, and high-fidelity simulation tools that enable advanced research in space situational awareness, satellite operations, and hypersonic systems. This includes support for multiple MURI awards, such as the 2022 project titled *"Realizing and Controlling Hypersonic Shock and Turbulence Interactions via Rarefaction Effects"* and the 2024 MURI titled *"Control of Hypersonic Flows by Phononic Subsurfaces"*. These projects leverage CU Boulder's shock tube facilities, high-speed imaging systems, and computational fluid dynamics platforms to explore rarefaction-driven flow control and acoustic-structure interactions, providing the experimental and modeling infrastructure necessary to advance vehicle survivability, thermal protection, and maneuverability at extreme flight regimes.

g. LASP maintains spaceflight hardware cleanrooms, thermal vacuum chambers, and a satellite operations center, supporting mission development for space weather and atmospheric science.

h. JILA and CU Boulder's Physics department host world-class labs with additional cleanroom facilities for quantum sensing and metrology, including ultrastable lasers, cryogenic vacuum systems, and optical clock platforms critical for the development of next generation, quantum-based positioning, navigation and timing (PNT) systems.

i. CU Boulder's human performance research uses CU Boulder's neuroimaging suite (including EEG and fNIRS), virtual reality labs, and biosignal monitoring equipment to study cognitive performance and physiological resilience. These tools are essential to the 2023 MURI on *"Cognitive Security and Its Mitigation,"* which includes neurophysiological data collection in immersive environments in support of human

performance in extreme environment. This research is directly relevant to enhancing capabilities of the warfighter.

j. CIRES researchers use remote sensing tools, polar field instruments, and geomagnetic and atmospheric monitoring platforms to support environmental intelligence and space weather resilience.

11. Physical facilities costs are one of the largest components of indirect costs. Thees include not only the costs of constructing and maintaining buildings where research occurs, but the very high costs of outfitting and maintaining specialized laboratory space, which can require advanced HVAC systems, pressurized air, specialized plumbing, electrical systems and waste management, as well as dedicated infrastructure needs of laboratory equipment. The features and amount of space available to researchers have a direct and obvious impact on the nature and amount of research that can be done at CU Boulder. CU Boulder is currently in the process of constructing a new academic and research facility aimed at advancing research and educational opportunities in chemistry and applied mathematics. The facility will host modern research laboratories for chemistry, applied mathematics and quantum research, supporting research in analytical spectroscopy, environmental chemistry and computational mathematics. The estimated cost of this facility is $177M, of which $4M annually in indirect cost recovery funds are anticipated to be used to meet debt service obligations. An ICR reduction to 15% would put this project at risk as the reduction of ICR would put tremendous pressure on CU Boulder to finance this critical project.

12. In addition, indirect costs fund the administration of awards, including staff who ensure compliance with a vast number of regulatory mandates from agencies such as DOD. These mandates serve many important functions, including ensuring research integrity, security and compliance; properly managing and disposing of chemical and biological agents and other materials used in research; managing specialized procurement and security clearance processes for sensitive research; managing funds; preventing technologies and other sensitive national security information from being inappropriately accessed by foreign adversaries; providing the high level of cybersecurity, data storage, and computing environments mandated for regulated data; ensuring compliance with specialized security protocols and

safety standards; maintaining facility accreditation and equipment calibration to meet research quality and security standards; and preventing financial conflicts of interest. Along with having the competencies to manage these tasks, these staff sometimes must have security clearances and other approvals to work on sensitive DOD projects.

13. Recovery of CU Boulder's indirect costs is based on predetermined rates that have been contractually negotiated with the federal government.

14. Through fiscal year 2024, CU Boulder's predetermined indirect cost rate agreed upon by the federal government as of 2022 is 56.5%.

15. The effects of a reduction in the indirect cost rate to 15% would be devastating. In Fiscal Year 2024, CU Boulder expended approximately $28.7M in direct costs on DOD grants and cooperative agreements and recovered $8.7M in indirect costs, for a total of $37.4M in total expenditures. Similarly, in fiscal year 2025, CU Boulder expects to expend $28.8M in direct costs on DOD grants and cooperative agreements and recover $8.7M in indirect costs. And over the next five years, CU Boulder anticipates expending an average of $30M in annual direct costs from the DOD. Based on the current indirect cost rate of 56.5%, which was agreed upon by the federal government as of 2022, CU Boulder reasonably expects to receive approximately $9.1M in indirect cost recovery on an annual basis over the next five years.

16. If—contrary to what CU Boulder has negotiated with the federal government—the indirect cost rate was reduced to 15% for new awards, that would quickly reduce CU Boulder's anticipated annual indirect cost recovery by $6.7M, from $9.1M each year to $2.4M a year. Application of such a rate to existing awards would decrease recovery even more quickly.

17. This reduction will have deeply damaging effects on CU Boulder's ability to conduct research from day one. Many of CU Boulder's current research projects will be forced to slow down or cease abruptly if we are required to apply for new awards or renewals at the 15% indirect cost cap or have our awards terminated if we will not accept a 15% rate cap. And a rapidly-growing reduction in DOD

funding would need to be factored into our financial planning, investments, hiring, and the like now. It will also necessarily and quickly result in staffing reductions across the board. For example:

a. This loss will have an immediate deleterious impact on the success of CU Boulder's DOD sponsored research projects and ability to maintain staff and infrastructure critical to those projects. It is estimated that cutting overhead rate to 15% will cause a reduction of $33.5M over the next 5 years. Based on current allocation of indirect costs to support administrative units, this will correspond to a loss of approximately 35 positions in units including the Office of Contracts and Grants, Campus Controller Office, Research Compliance and Export Controls as well as unit-level administrative positions within the College of Engineering and Applied Science (Computer Science, Aerospace Engineering, Electrical Engineering, Civil Engineering, Chemical and Biological Engineering, and Mechanical Engineering), the College of Arts and Sciences (Physics, Chemistry, Psychology, Integrated and Physiology) the Renewable and Sustainable Energy Institute (RASEI), the Institute for Artic and Alpine Research (INSTAAR), the Laboratory for Atmospheric and Space Physics (LASP), and JILA.

18. If CU Boulder's DOD financial assistance awards are terminated for failure to accept the new indirect cost rate cap in a renegotiation—a risk that the majority of our DOD awards would face, given the impossibility of carrying out most of our research projects under the 15% cap—the harms described herein would be exacerbated. That greater loss in funding from DOD would mean more significant cost-cutting measures would need to be adopted quickly. CU Boulder cannot "float" all of the DOD awards it would likely lose, so some research projects would need to be terminated altogether, and others would need to be scaled down or pared back significantly. The process of identifying these cuts would need to begin immediately, and layoffs, closures, and research pauses or contractions would follow soon thereafter. Reducing CU Boulder's research in critical fields such as geospatial modeling, space operations, defense technology, material science, electrical engineering (including advancements in quantum systems, high-frequency communications, signal processing, and secure hardware), aerospace

engineering (addressing challenges in space domain awareness, hypersonic systems, and secure satellite operations), quantum physics, and quantum phononics will have long-term implications on national security and the American economy.

19. CU Boulder has for decades relied on the payment of indirect costs. And until now, we have been able to rely on the well-established process for negotiating indirect cost rates with the government to inform our budgeting and planning. Operating budgets rely on an estimate of both direct and indirect sponsored funding to plan for annual staffing needs (*e.g.*, post-docs, PhD students, and other research staff), infrastructure support (*e.g.*, IT networks, regulatory compliance, and grant management support), and facility and equipment purchases. And in some cases, CU Boulder has long-term obligations—for example, debt service on research facilities and over 100 admitted PhD students supported by DOD awards—and it relies on budgeted award funding, including associated indirect cost recovery, to fulfill these commitments. This multi-year budgeting process also assumes the availability or possibility of award renewals and new awards at roughly similar terms—and certainly at the negotiated indirect cost rate—as had been previously available.

20. In addition to the immediate effects and reliance interests described above, dramatically cutting indirect cost reimbursement would have longer-term effects that are both cumulative and cascading. The areas of research where the DOD has invested include those where i) there is extensive foreign competition, particularly in advanced materials science and quantum technologies, which are critical for maintaining technological superiority and national security. ii) the development of secure, energy-efficient electronic systems and next-generation sensing technologies vital for defense applications, as seen in the research at RASEI on chiral spintronics and interface engineering, iii) advancements in human-machine collaboration and autonomous systems essential for enhancing mission adaptability and operational effectiveness in dynamic and unpredictable environments, as demonstrated by the projects in CU Boulder's Computer Science department, and iv) innovations in aerospace engineering, such as hypersonic systems, secure satellite operations, and space domain awareness, crucial for maintaining U.S. capabilities in

contested air and space environments, ensuring strategic defense capabilities and technological superiority. Each of these examples are seen as critical to our national security and economic security.

21. Disruptions to CU Boulder's research will also have negative effects in the the Boulder area, the state of Colorado, and the broader region. More than 13,500 Colorado residents are directly employed by CU Boulder—and it collaborates with state and local partners to help solve regional challenges through joint research and innovation. The University of Colorado Boulder's research also fuels spending in the regional economy, including by driving discoveries that launch new ventures, attract private investment, and make a positive social impact. CU Boulder research expenditures (including equipment, construction, operations, and labor) were estimated at $737M in FY2023–24. The economic contribution of these research activities totaled $1.4B on the Colorado economy in FY2023–24. A massive reduction in CU Boulder's research budget would immediately and seriously jeopardize these contributions to the local region.

22. Finally, slowdowns or halts in research by CU Boulder and other American universities will allow competitor nations that are maintaining their investments in research to surpass the United States on this front, threatening both our Nation's national security and its economic dominance. At CU Boulder, critical research areas that would be impacted include quantum science and engineering, energy systems and grid resilience, aerospace and planetary science, material science, health science, and artificial intelligence. These fields are essential for addressing national priority challenges and national security.

23. CU Boulder cannot cover the funding gap itself. The University of Colorado Foundation maintains an endowment for the entire University of Colorado system, and not the individual campuses. Additionally, endowment funds are restricted based on the individual donor the donor agreement, meaning it is neither feasible nor allowable for the University of Colorado Boulder to use endowment funds to cover funding gaps created by a reduction to indirect cost rates.

24. It is also not feasible or sustainable for CU Boulder to use other revenue sources to offset shortfalls in indirect cost recovery. As a non-profit institution, CU Boulder reinvests nearly all of its revenue into mission-critical activities, leaving little margin to absorb unexpected funding gaps. In other

words, unlike for-profit organizations, CU Boulder does not generate significant surpluses that could be redirected without impacting core academic priorities such as educational programs and financial aid support for students. Absorbing the cost of a lower indirect cost rate, even if it were possible, would create long-term budget pressures on CU Boulder—which would in turn force reductions in key investments supporting CU Boulder's faculty, students, staff, research, and teaching infrastructure, as well as other critical activities needed to maintain CU Boulder's academic excellence. So even if CU Boulder could "cover" some of the indirect costs previously funded by DOD, it could do so only by negatively affecting other critical goals central to the institution's mission.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on June 15, 2025, at Boulder, Colorado.

Signed by:
Justin Schwartz
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Dr. Justin Schwartz, Chancellor