Introduction

The history of the Soviet Union and the history of space exploration share a paradoxical quality: each is a history of possible futures. At times, both the Soviet project and the space program were grounded in deep-rooted expectations for new possibilities, utopian and pragmatic in nature. The coincident nature of these two projects – one largely social and the other broadly technological – has reinforced the notion that the Soviet space program was the outcome of forces that were deeply consistent with the aims and ideologies of the state. As a result, our understanding of the Soviet space program has been encumbered with a tone of inevitability, as if the effort inexorably sprang from a massive state infrastructure driven only by ideological considerations.

This perceived intersection of ideology, state intervention, and technology was embodied most potently in Sputnik, the world’s first artificial satellite. In the days and weeks after Sputnik’s October 4, 1957 launch, these connections provided a forceful narrative for the Soviet and Western media, the former seeking to create a new history of its cosmic enthusiasm, and the latter eager to use that history to highlight the crisis of Western power at the height of the Cold War. This first satellite, whose name in Russian meant “fellow traveler,” fell from the heavens within a few weeks of its launch. Despite its early demise, Sputnik has remained in our collective imagination not only as a potent symbol of the political, social, and cultural possibilities of the late twentieth century but also as a metaphor for human aspirations and expectations for an exhilarating future.

Within the Soviet Union, the satellite and its successors invested the rising hopes of a new postwar “Sputnik generation” with a powerful icon.1 Given the often conflicting hopes and disappointments of the Khrushchev era, the project of spaceflight was one of the few state policies that united all in its utopianism, heroism, and iconography. By the time cosmonaut Iurii Gagarin returned to Moscow after his historic flight into the cosmos in 1961, more people assembled in Red Square to welcome him than had for the parades celebrating victory in the Great Patriotic War. Sputnik, like

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Gagarin, represented a powerful symbol for restoring Soviet pride in the aftermath of the economic, social, and political shocks of late Stalinism.

*Sputnik* also served as potent evidence of the country’s arrival as a superpower on the international stage. Five days after the launch, the front page of *Pravda* distilled its import down to a single headline: “A Great Victory in the Global Competition with Capitalism.” Loudly and often crudely, Nikita Khrushchev used the early successes in the Soviet space program to emphasize the political, social, technological, and ideological power of the modern Soviet Union. *Sputnik* also ensured serious consideration of Soviet claims – whether about science, or military power, or the economy. For years, many Western observers had disregarded Soviet assertions as crude propaganda, but the clear trail of the *Sputnik* satellite above the night skies of the American Midwest denuded the dismissive tenor of Westerners of its power, making clear once and for all that Soviet claims for global pre-eminence in science and technology rested on inarguable truths. There was also the unmistakable military connotation of *Sputnik*; implied in the many communiqués about the first satellite was the notion that any country capable of lobbing a satellite overhead could also deliver a nuclear bomb to the other side of the world. “Missile diplomacy” during the Khrushchev years depended to a large degree on the highly publicized successes of the early sputniks; the perceived Soviet mastery with rockets and space exploration fueled international confrontations of the early 1960s such as the Berlin and the Cuban Missile Crises.

In the United States, *Sputnik* shocked a seemingly complacent society, secure in their new suburbs, vast highways, color televisions, and the highest peacetime budget in history. Launched on the same night that *Leave it to Beaver* premiered, *Sputnik* awoke a nation. Walter McDougall noted that “[n]o [single] event since Pearl Harbor set off such repercussions in public

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A crisis of confidence washed over most of American society. The Eisenhower Administration produced legislation to create several new agencies, including the National Aeronautics and Space Administration (NASA). By the early 1960s, government-funded projects to improve the scientific and engineering expertise of the country vastly expanded. Believing that better education in Soviet Russia contributed to Sputnik, huge amounts of money poured into the American higher education system, making it a key component in the battles of the Cold War. These policies – the creation of new government agencies, increases in state-sponsored research and development, and the expansion and restructuring of higher education – significantly influenced America’s political, social, and cultural trajectory in the Cold War.

Historians have repeated a common narrative about the origins of Sputnik. It begins with the “patriarch” of Soviet cosmonautics, Konstantin Tsiolovskii, who in 1903 mathematically substantiated that spaceflight was possible with the aid of liquid-propellant rockets. According to this deeply ingrained story, the Bol’sheviks recognized the value of Tsiolovskii’s work after the Russian Revolution, honored him with many awards, and declared him a national treasure. Inspired by Tsiolovskii, young enthusiasts came together to build rockets. The Soviet government supported them, and in 1933 it sponsored the creation of a Reactive Scientific-Research Institute to build rockets. The institute produced remarkable scientific and technical results, gradually moving in parallel with the Germans until the Great Terror decimated the leaders of the effort. Historians believed that the rocketry effort was dealt a near-fatal blow and did not rebound until after the war, when Soviet engineers scoured Germany for the detritus of the Nazi rocket program. German engineering jump-started the Soviet rocketry program, and soon, Soviet designers under the charismatic Sergei Korolev began methodically building more powerful rockets. The designers convinced the Soviet government to use the new R-7 intercontinental ballistic missile to launch a satellite into space. The missile successfully inserted the...
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small metal ball known as Sputnik into orbit in late 1957, inaugurating the space era.

Most of the literature on Sputnik – which essentially replays this idealized narrative arc – has leaned on a number of unquestioned presuppositions. The most important of these is the conceit that the preamble to Sputnik was characterized by sustained symbolic and material support of cosmic ideas by the state, which began in the aftermath of the Russian Revolution of 1917. This assumption goes hand in hand with an understanding that the state’s intervention into matters of rockets and space also took the form of indiscriminate violence during the Great Terror in the late 1930s as a result of which the Soviet drive to the cosmos was immeasurably hindered. The notion of the “noble” scientist runs through this story, particularly in the name of Sergei Pavlovich Korolev – the founder of the Soviet space program, whose dreams of the cosmos overcame the horrific injuries of Stalinism. The hagiographic trope of “triumph over adversity” has been a consistent thread in the narrative of the Soviet space program. By focusing on some key individuals such as Korolev and Nikita Khrushchev, the conventional histories obscure the contributions of hundreds of thousands who were as much responsible for Sputnik as the men at the apex.7

Scholars have revisited the history of the Soviet space program but none have situated the development of rocket technology in the broader context of Soviet social and cultural history.8 Russian historians, although freed from Soviet-era constraints, have been mired in celebration and hagiography and have avoided critical contextual questions.9 Social and cultural historians of the Soviet Union have, meanwhile, typically avoided the topic of space exploration, seeing in it fodder only for techno-buffs and unreconstructed Cold Warriors. Those who have studied this history have focused


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only on the halcyon days of the 1960s rather than the origins of Soviet cosmic aspirations. Perhaps the most limiting factor was the dearth of archival sources, which were opened to scholars only after the collapse of the Soviet Union. Without primary sources, which conveyed the voices of the main actors, historians were unable to ask or answer difficult and nuanced questions about the space program.

Many have written about the Bol’shevik state’s love affair with science and technology. A measure of technological utopianism had already emerged in Tsarist Russia at the turn of the century, but after the Bol’sheviks came to power in 1917, this fascination embodied a millenarian mantra. This obsession with the power of science and technology to remake society was partly rooted in crude Marxism but much of it derived from the Bol’sheviks’ own vision to remake Russia into a modern state, one which would compare and compete with the leading capitalist nations in forging a new path to the future. Here, the tools of capitalism – Ford’s mass production, Taylor’s scientific management, and the Wright Brothers’ airplane – were value-neutral systems that could be relocated into a socialist context without the exploitative costs of capitalism; science and technology could, in this way, be de-linked from one ideology and connected to another.

The Bol’sheviks never adhered to a singular and sustained vision of the role of science and technology in building the new Soviet Union; on the contrary, the Party’s approach was neither monolithic nor consistent. For example, in the 1920s, during the time of the New Economic Policy (NEP), the Bol’sheviks reluctantly embraced the old pre-Revolutionary scientific elite, conceding that their skills might be of use during a period of reconstruction. But by the 1930s, after the Cultural Revolution, Stalinist imperatives resulted in a backlash against the old intelligentsia who were seen as being divorced from the “real” problems of socialist construction. Instead, Party directives embraced a more populist stance on science and technology, “technology for the masses,” in the words of a popular adage of the day.

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Historians of Soviet and Russian science have, however, largely avoided the space program. Two disciplinary considerations have kept them away. First, their primary concern has been the natural and physical sciences and not technology. Second, their interests led them to problems that exposed ideological “interference” in science rather than cases such as the space program that seemed to support rather than be distorted by official state discourses. During the Cold War, pioneering scholars of Soviet science such as David Joravsky and Loren Graham underscored the important relationship between ideology and Soviet science. Yet most laypeople typically understood this connection within the Soviet context as discrete and unidirectional. For example, the “failures” of Soviet science, including the disastrous case of Lysenko and the ban on genetics research from 1948 to 1964, represented stark examples of the negative influence of ideology on science. Meanwhile, the successes of Soviet science were seen as exceptions where Soviet scientists succeeded despite the draconic and limiting structures imposed upon them. The past decade-and-a-half of scholarship on Soviet science has completely overturned such views. Besides returning agency to the scientific community and investing our understanding of the role of scientific and engineering practice under Stalin with deeper complexity and nuance, the most important achievement of this new literature has been to dislodge the perception that the Lysenko affair was emblematic of Soviet science as a whole.


Although written partly with the aim of making Soviet scientists agents of their own fate, Nikolai Krementsov’s Stalinist Science (Princeton: Princeton University Press, 1997) helped to reinforce the centrality of the Lysenko episode in our understanding of Soviet science. For an excellent critique of this earlier school of thought, see Michael D. Gordin, “Was There Ever a ‘Stalinist Science’?,” Kritika: Explorations in Russian and European History 9 no. 3 (Summer 2008) 625–639.


17 Although written partly with the aim of making Soviet scientists agents of their own fate, Nikolai Krementsov’s Stalinist Science (Princeton: Princeton University Press, 1997) helped to reinforce the centrality of the Lysenko episode in our understanding of Soviet science. For an excellent critique of this earlier school of thought, see Michael D. Gordin, “Was There Ever a ‘Stalinist Science’?,” Kritika: Explorations in Russian and European History 9 no. 3 (Summer 2008) 625–639.
If the relationship between science and the Soviet state (and indeed the lack of delineation between the two) has been a subject of much fresh inquiry, mass engagement with science and technology during Soviet times, including popular (and populist) enthusiasm for science, has, until very recently, been a marginalized field. Mass campaigns involving science and technology were, however, part and parcel of prevailing Soviet culture, especially in the interwar years. James Andrews’ recent work on public science has underscored the ways in which public enthusiasm was not simply a result of structured state directives but had significant foundation in genuine mass interest in the powers of science and technology. Lewis Siegelbaum and Scott Palmer have also explored specific dimensions of public engagement with science and technology, deepening our understanding of how Soviet scientific enthusiasm was a peculiar combination of the mundanely practical and the grandiosely symbolic. This new work has not been monolithic. Where Siegelbaum sees automobile users as appropriating automotive technology in ways unanticipated by the state, Palmer sees the state as a more powerful force that exploited fascination with aviation to distract the populace from the earthly realities of the day.

Mass enthusiasm for science and technology in Soviet times had their own peculiarities, but they can be best understood as part of broader (usually) state-sponsored campaigns to encourage large segments of the population to invest their work and life with the transformative spirit of the Bol’shevik project. The most obvious touchstones here include Stakhanovism but there were many others, such as the celebration of new secular holidays and festivals, popular campaigns focused on atheism, stratospheric and arctic exploration, literacy initiatives, and industry-related programs such as the shock worker movement. Historians who have investigated these phenomena have contended that mass enthusiasm for these causes were not cynically fostered by a monolithic state exerting power over a passive populace; they were the result of earnest “bottom-up” zeal that often mutated into forms at odds with the original intention of the campaigns.

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This book builds upon both the recent scholarship on Soviet science and technology and the new literature on mass campaigns in the Soviet milieu. It is the first to revisit Sputnik by locating its birth within Soviet and Russian social and cultural history. Grounded in archival research, it recovers an alternate history of the birth of the Soviet space program, giving voice to those who were at the center in action but were consigned to the periphery in recollection. It is a story of utopian ideals, expansive imagination, and popular mobilization.

I reframe the birth of the Soviet space program by bridging imagination with engineering – seeing them not as dialectic, discrete, and sequential but as mutable, intertwined, and concurrent. Both imagination and engineering were necessary to attain the reality of space exploration. Russian imagining of the cosmos dated back to the late nineteenth century, a time when the first seeds of cosmic enthusiasm were sown in the broader literate public. This curiosity percolated into a burst of utopian fascination in the 1920s that inspired and then intersected with the practical realities of rocket engineering a decade later. Imagination and engineering not only fed each other but were coproduced by key actors who maintained a delicate line between secret work on rockets (which interested the military) and public prognostications on the cosmos (which captivated the populace). Sputnik was the outcome of both large-scale state imperatives to harness science and technology and populist phenomena that frequently owed little to the whims and needs of the state apparatus.

This book is also one of the first social histories of Soviet science and technology, one that describes the popular mobilization for science and technology rather than simply a story of state directives and elite communities. It contests accepted notions about the origins of the Soviet space program, about the history of Soviet science and technology, and more broadly, about the spaces for local initiative in Soviet society. I argue that the primary state institution typically associated with the advancement and sponsorship of Soviet science, the Academy of Sciences, was only marginally involved in the genesis and creation of one of the greatest public advertisements for Soviet science, their space program. Instead, the century-long origin of the Soviet space program provides evidence of a kind of “science from below,” which later intersected with the military imperative to build rockets in giving birth to the space program.

The first major theme of this study centers on the state’s relationship to the cause of space exploration. Undoubtedly, the launch of Sputnik would have been impossible without the vast state commitment to develop the intercontinental ballistic missile that inserted the satellite into orbit. But though the development of the ICBM is a fundamental part of the story of Sputnik’s birth, Party and government leaders considered it first and foremost a strategic weapon to deter the United States; without the intervention of a small group of missile designers who were also active space enthusiasts, the two
originating streams of utopian imagination and military engineering might not have intersected. In the received narrative of Soviet space history, the state appears as the central and indispensable agent in creating the Soviet space program, beginning with its grand and supposedly farsighted gestures in the 1920s and 1930s in elevating spaceflight as an important goal for the nation. In fact, Party and government officials had no interest in cosmic topics until the early 1950s.

That the state played an important role in every facet of Soviet life is inarguable, but as social and cultural historians have argued for decades now, agency also resided in the Soviet populace. All aspects of Soviet life at the height of Stalinism – such as work culture, urban life, family, mass campaigns, language, ritual, and aesthetics to name only a few – were defined by the outcome of negotiations between state actors and those outside the formal levers of power.\footnote{For a few recent examples, see Wendy Goldman, Women, the State, and Revolution: Soviet Family Policy and Social Life, 1917–1936 (Cambridge, UK: Cambridge University Press, 1993); David Hoffman, Peasant Metropolis: Social Identities in Moscow, 1929–1941 (Ithaca, NY: Cornell University Press, 1994); Lewis Siegelbaum and William Rosenberg, eds., Social Dimensions of Soviet Industrialization (Bloomington: Indiana University Press, 1993); Stephen Kotkin, Magic Mountain: Stalinism as Civilization (Berkeley: University of California Press, 1995); Matthew E. Lensoe, Closer the Masses: Stalinist Culture, Social Revolution, and Soviet Newspapers (Cambridge, MA: Harvard University Press, 2004).} Not only did the state’s attempt to legislate most public behavior frequently have unexpected outcomes, but the state could not intervene in all aspects of Soviet life, leaving key areas where the seemingly powerless were able to shape important phenomena.

During the Soviet era, the state also had a deep and abiding interest in the management of public opinion.\footnote{See, for example, Sarah Davies, Popular Opinion in Stalin’s Russia: Terror, Propaganda, and Dissent, 1934–1941 (Cambridge, UK: Cambridge University Press, 1997).} Mobilizing public attitudes in support of state imperatives was not, however, always easy or successful. In fact, as I show, at various times during the Soviet era – including at the height of Stalinism – it was possible for public opinion to mold state choices about science and technology, especially if those arguing on behalf of the public invoked the threat of foreign competition. For example, in the early 1950s, Soviet space enthusiast writers successfully elevated space exploration as a worthy goal for the Soviet Union in the backdrop of increasing American publications on the topic. In other words, the creation of a popular consensus about the place of science and technology in Soviet society was an important factor feeding state policy. Historians of Russian science, accustomed to focusing on elite scientific communities and their relationship to state ideologies, have largely missed these interactions, rendering invisible a key lever of influence on state science and technology policy.\footnote{Andrews’ Science for the Masses was the first major work on the topic of science as a public phenomenon, although he stopped short of mapping the public discourse with formal scientific and technical work at the institutional level.}
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The gaps in the standard social history of Soviet science led me to the second major theme of my work, the social factors – specifically people involved in self-motivated activity – in enabling the project of spaceflight. These included, but were not limited to, amateur individuals without any formal education, members of semigovernmental mass voluntary societies, and science popularizers and journalists. My goal is to relocate the development of rockets and the advocacy of spaceflight in broader Soviet social and cultural history. By this, I mean not just the upheavals generally associated with Soviet science, but also, for example, the cultural explorations of the period of New Economic Policy (NEP), the social forces that led to the Great Terror, and post–World War II visions of technological utopianism.

Beginning in the 1920s, disparate men and women joined together in urban centers across the Soviet Union to establish informal networks to exchange ideas on the possibility of space exploration. Despite complete (and understandable) indifference from the Soviet government, these networks flourished, leading to the formation of early amateur societies, circles (kruzbi), and exhibitions that played key roles in fostering the first widespread interest in space exploration among the Soviet populace. Space and rocketry activists reframed their rhetoric to adjust to prevailing social and political conditions. For example, in the early 1930s, they worked through mass voluntary societies and touted the advantages of “stratospheric” exploration; in the 1940s, they established a powerful network of rocket designers in Soviet-occupied Germany; and in the 1950s, defense industry designers on the “inside” formed an effective alliance with journalists on the “outside” to mobilize public opinion in support of a space program, once again despite a lack of interest from the government. In each case, the nature of the discourse generated or the type of rocket produced was neither predetermined nor inevitable but resulted from a complex play of social, political, and military factors; it was “socially constructed,” in the parlance of historians of technology.


For important works on the social construction of technology, see Wiebe E. Bijker, Thomas P. Hughes, and Trevor J. Pinch, eds., The Social Construction of Technological Systems: New Directions in the Sociology and History of Technology (Cambridge, MA: MIT Press, 1987); Merritt Roe Smith and Leo Marx, eds., Does Technology Drive History? The Dilemma of Technological Determinism (Cambridge, MA: MIT Press, 1995); Donald Mackenzie,