

SPACE WEATHER SCIENCE

Recent advances in space research have deepened our understanding of how solar phenomena, especially Coronal Mass Ejections (CMEs), affect celestial bodies across the solar system. While Earth has long been studied in the context of solar storms due to its protective magnetosphere and atmosphere, a lesser-explored but equally intriguing subject is the effect of CMEs on the Moon. Without a magnetic field or a substantial atmosphere, the Moon provides a unique laboratory to study the raw, unfiltered impact of solar activity - especially CMEs - on rocky planetary surfaces.

A Coronal Mass Ejection is a powerful burst of solar plasma and magnetic field ejected from the Sun's corona. When these high-energy solar storms are directed toward the Moon, they interact directly with the lunar surface, causing a range of effects that have both scientific and practical implications.

One of the primary consequences of CMEs on the Moon is space weathering. The high-energy particles from CMEs bombard the lunar regolith, altering its physical and chemical composition. This leads to the darkening of the soil, a process that gradually changes the reflectivity (albedo) of the Moon's surface over time. Unlike Earth, which is shielded by its magnetic field, the Moon is fully exposed to these high-energy particles, making it an ideal natural archive of solar activity.

Another significant effect is electrostatic charging. As CME particles hit the Moon, they can cause different regions of the surface to become electrically charged. This could result in dust levitation or redistribution, as seen in various lunar missions. Such electrostatic phenomena may influence the planning and design of future lunar habitats, equipment, and exploration strategies. For instance, understanding dust behaviour is essential for the longevity of machinery and safety of astronauts during upcoming lunar missions like NASA's Artemis program.

Moreover, CMEs can also trigger secondary particle emissions from the lunar surface. These interactions can generate gamma rays and neutrons, which are valuable for scientific instruments used in remote sensing. Analyzing these emissions helps in understanding the composition of the lunar crust and detecting hidden resources such as water ice.

Perhaps one of the most important implications of CME interactions with the Moon lies in astronaut safety. Unlike Earth, the Moon does not offer natural protection from cosmic radiation and solar particle events. High-intensity CMEs could significantly raise radiation levels on the Moon, posing serious health risks to astronauts. This makes it essential to develop robust space weather forecasting systems and radiation shielding technologies before establishing long-term human presence on the lunar surface.

The Moon's direct exposure to the effects of CMEs provides not only critical data for understanding space weather but also vital information for safeguarding future lunar missions. As interest in lunar exploration grows, studying how solar events like CMEs interact with the Moon is no longer a purely academic pursuit - it is a cornerstone of sustainable and safe space exploration. Investments in monitoring solar activity and its impact on the Moon will ensure both scientific advancement and the protection of human life beyond Earth.

Darbar Move Makes a Comeback

■ **BAIRAJ CHAWALGAMI**

The revival of the historic Darbar Move by the Jammu and Kashmir government marks a momentous development in the region's administrative and cultural landscape. Chief Minister Omar Abdullah's decision to restore this age-old practice has reignited a long-standing debate over tradition, governance, and economic practicality. The move, which involves the biannual shifting of the civil secretariat and other government offices between the twin capitals of Srinagar and Jammu, was a defining feature of Jammu and Kashmir's administrative heritage for nearly a century and a half. It symbolized not only a functional necessity in the bygone era but also a cultural bridge uniting two diverse regions—each distinct in geography, climate, and sentiment. The Darbar Move, first introduced by Maharaja Gulab Singh in 1872, was conceived to ensure equitable administrative access to both the Kashmir Valley and the Jammu plains. In those days, the road connectivity between the two regions was poor, and communication was often hindered by harsh weather conditions. To overcome these limitations, the Maharaja decided that the civil secretariat and key government departments would shift to Jammu during the winter months and return to Srinagar in the summer. Over time, this semi-annual migration evolved into a deep-rooted tradition, representing a symbol of unity, administrative inclusiveness, and cultural integration. Even after 1952, when Jammu and Kashmir was accorded special status, the practice continued as a vital link between the regions—ensuring that governance was not confined to one part of the state but accessible to all.

However, the Darbar Move was abolished in June 2021 by the then Lieutenant Governor, Manoj Sinha, citing the advent of modern technology, improved road networks, and the establishment of a robust e-office system. The decision was justified on the grounds of efficiency and economy, as the annual shifting of thousands of employees, records, and logistics incurred huge expenses running into crores of rupees. Despite these arguments, the abolition was met with disappointment and resentment in several quarters, particularly among

Jammu's business community, for whom the Darbar Move had long been a source of livelihood. Hotels, restaurants, transporters, taxi operators, and traders in Jammu relied heavily on the influx of government employees and officials during the winter months, which provided a much-needed economic boost to the region. Now, after a hiatus of more than four years, the Omar Abdullah-led National Conference government has decided to reinstate this traditional practice. The decision, according to the Chief Minister, aims to restore the historical and socio-cultural legacy of Jammu and Kashmir while simultaneously taking the administration closer to the people. The move has been described by the government as a step toward reviving an old bond of inter-regional interaction and ensuring that governance remains people-centric rather than confined to the digital domain. The file proposing the restoration of the Darbar Move was recently approved by the Lieutenant Governor, signaling the formal commencement of the process. The General Administration Department (GAD) has since issued Order No. 1357-JK(GAD) of 2025, outlining the schedule for the closure of government offices in the summer capital Srinagar and their reopening in the winter capital Jammu.

As per the order, thirty-nine departments, including the Chief Minister's Secretariat, will move to Jammu in full strength, while forty other departments will move partially, with a limited staff contingent of ten officials or thirty-three percent of their total workforce, whichever is less. This hybrid arrangement seeks to balance tradition with administrative efficiency, reducing the logistical burden while retaining the spirit of the Darbar Move. The decision has been received with enthusiasm in Jammu, especially among the business community, who see it as a revival of the city's economic lifeline. The Jammu Chamber of Commerce and Industry, led by its president Arun Gupta, has hailed the government's decision, expressing optimism that a complete restoration of the Darbar Move in its original form will rejuvenate trade, tourism, and local enterprise. Yet, the revival of this practice has also reignited debates over its contemporary relevance. Critics argue that the socio-economic

and technological realities of the 21st century have rendered the Darbar Move obsolete. With advanced e-governance platforms, seamless communication networks, and all-weather road connectivity between the two capitals, there seems to be little administrative justification for physically relocating entire departments twice a year. Opponents view the move as an unnecessary expenditure that drains the exchequer and disrupts the continuity of governance. They contend that the funds spent on logistics, transport, and temporary accommodation could instead be redirected toward public welfare projects, infrastructure, and digital transformation initiatives that would benefit citizens year-round.

Nevertheless, supporters of the Darbar Move counter that the decision transcends mere economics. They emphasize its symbolic and integrative value, asserting that it fosters a sense of unity and shared governance between the regions. The move, they argue, is not simply about shifting offices—it is about bridging historical divides, nurturing inter-regional understanding, and preserving a legacy that has defined Jammu and Kashmir's unique administrative identity for generations. For many, its restoration represents not just a political or administrative act but an emotional reaffirmation of the region's composite culture. Chief Minister Omar Abdullah, in defending his decision, has stated that governance is not only about files and computers but about human connection and accessibility. By reinstating the Darbar Move, he aims to revive a tradition that once ensured the government's presence in every corner of the region. The administration, he says, must not operate from the confines of a single capital but should remain visible, mobile, and responsive to people's needs across geographical and cultural boundaries. This vision, though rooted in history, is projected as a bridge to the future—one that combines traditional inclusivity with modern adaptability.

While the practical implications of this revival remain to be seen, the decision has undoubtedly stirred renewed political and public discourse across Jammu and Kashmir. For many residents of Jammu,

especially traders and service providers, the return of the Darbar Move brings a sense of relief and renewed economic hope after years of downturn following its abolition. For others, particularly technocrats and reformists, it raises questions about the efficiency of governance in an era driven by digitization and decentralization. The challenge for the Omar Abdullah government will lie in balancing these competing perspectives—preserving the essence of a cherished tradition while ensuring administrative pragmatism and fiscal responsibility. In the broader sense, the restoration of the Darbar Move is more than an administrative shift; it is a reaffirmation of Jammu and Kashmir's historical continuity and regional interdependence. It reconnects the present with the past, honoring a legacy that once united two distinct regions under a single administrative umbrella. Whether this revival proves to be a nostalgic return to history or a pragmatic move toward inclusive governance, only time will tell. But one thing is certain: the decision has reignited the spirit of dialogue, identity, and tradition in a region whose story has always been intertwined with change and resilience.

The Omar Abdullah-led government's revival of the 150-year-old Darbar Move marks a reversal of the 2021 decision by the then LG Manoj Sinha administration, which had abolished the practice citing savings of ₹200 crore annually. That move had angered traders, especially in Jammu, where the Darbar tradition was a major economic driver during winters. With its restoration, economic optimism has returned to Jammu—often called the City of Temples—where local businesses and traders welcome the expected revival of trade and tourism. Supporters argue that beyond economics, the decision will rebuild social and cultural bonds between Jammu and Kashmir, strengthening regional harmony. Critics, however, call the revival outdated and wasteful in the age of e-governance, claiming it undermines administrative efficiency and financial prudence. While politically symbolic and rooted in regional aspirations, whether this revival proves a blessing or a burden remains to be seen.

The Geopolitical Trap: Why Pakistan Can Never Defeat the Taliban and How It Will Shape South Asia

■ **AMEET KUMAR BALI**

In the turbulent theatre of South Asia, no conflict illustrates the fragility of state power more starkly than Pakistan's enduring battle with the Taliban. What began in the 1990s as a calculated alliance, forged to secure influence in Afghanistan and counter India, has devolved into an unending war that Islamabad can neither control nor conclude. This confrontation is no longer about territorial integrity or ideological supremacy. It is about the survival of Pakistan's state structure and, by extension, the balance of power across the region.

For decades, Pakistan's military establishment viewed Afghanistan as its "strategic depth," a geopolitical buffer designed to provide leverage against India. To this end, it cultivated Islamist factions, including the Taliban, as instruments of influence. Yet history has turned the weapon inward. The Tehrik-i-Taliban Pakistan (TTP), born from the same ideological womb as its Afghan counterpart, now mirrors Pakistan's own tactics

against itself. Every drone strike, every counterinsurgency operation fuels fresh cycles of resentment, transforming the fight into a self-perpetuating conflict that drains the nation's morale and resources.

Recent events have further exposed this crisis of control. In mid-2025, Pakistan's army triumphantly declared victory over Taliban fighters in the Kurram sector, claiming to have destroyed enemy positions and captured tanks. Within hours, Taliban militants flooded social media with footage of seized Pakistani tanks and abandoned posts. The optics were devastating. Pakistan's victories exist largely in official communiqués; its defeats, in viral videos. The Taliban's strength lies not merely in battlefield endurance but in its mastery of the narrative, a war of perception that Pakistan, despite its intelligence apparatus and military might, continues to lose.

Beneath these visible confrontations lies a deeper geopolitical struggle. Although the United States has long withdrawn its troops, Washington's

strategic gaze has never left the region. Its renewed interest is not solely counterterrorism but the containment of China and Russia's growing reach. When former U.S. President Donald Trump, in September 2025, demanded that the Taliban return control of the Bagram Air Base, it revealed America's enduring appetite for a foothold in Central Asia. Bagram, often called a "strategic gold mine," offers access to intelligence, surveillance, and trade arteries stretching over Central Asia, Iran, and China's western flank. Control over Bagram, therefore, equates to dominance over the region's geopolitical bloodstream.

This revived U.S. engagement places Pakistan once again in a perilous position, torn between Western demands for compliance and Taliban threats of retribution.

Meanwhile, the Taliban's resilience is transforming the broader regional equation. Afghanistan has become the ideological pivot of South Asia, exporting militancy, narcotics, and refugees across fragile borders. Pakistan, consumed by internal strife and economic instability,

finds its democratic institutions eroding under perpetual militarization. India, by contrast, is exercising strategic patience, deepening its ties with Iran, Central Asia, and Western powers, gradually emerging as a stabilizing force in a volatile neighbourhood. China, though heavily invested in Pakistan's infrastructure through CPEC, faces growing anxiety over Islamist spillover into Xinjiang. Iran, ever pragmatic, is tightening control over its eastern frontier and nurturing covert ties with select Pashtun factions, positioning itself as a counterweight to both U.S. and Taliban ambitions. In this shifting landscape, the Taliban has evolved from a militant movement into a geopolitical equalizer; redistributing influence, fear, and uncertainty across South Asia.

Pakistan's deepest challenge, however, is not military but ideological. Since its inception, the state has failed to reconcile its Islamic identity with the demands of a modern, constitutional democracy. The Taliban exploits this intellectual vacuum by projecting itself as the "authentic"

guardian of faith, while portraying Islamabad as a compromised puppet of the West. Unless Pakistan defines a coherent national identity, one that is both spiritually rooted and institutionally modern. It will remain vulnerable to ideological subversion. The Taliban's power does not emanate from its weapons but from the vacuum of belief it occupies.

As South Asia approaches the 2030s, several trajectories appear inevitable. The Pakistan and Afghanistan frontier will remain volatile, plagued by insurgencies and retaliatory strikes. Persistent militarization and insecurity will deter foreign investment, deepening Pakistan's economic isolation. India will continue its strategic ascent, leveraging partnerships with Western and Asian powers to consolidate regional influence. China, wary of entanglement, may diversify trade routes through Central Asia, recalibrating its dependence on Pakistan. The United States, eschewing direct military involvement, will likely reinsert itself through intelligence operations, drone warfare, and regional proxies particularly

ly around Bagram and northern Afghanistan.

The future of South Asia will thus not be determined by conventional wars of conquest but by subtler wars of influence fought through ideology, economy, and information. In this contest, narratives will outweigh armies, and legitimacy will matter more than firepower.

Ultimately, Pakistan's confrontation with the Taliban reflects the tragic consequences of decades of short-term strategic thinking. The Taliban, once a creation of Pakistan's geopolitical ambition, has become its existential nemesis, a force that embodies the contradictions of the state itself. For South Asia, the lesson is unmistakable: when nations weaponize faith to serve political ends, they forfeit control over their destiny. The region now stands at a decisive crossroads between cooperation and chaos. Unless Pakistan reconciles the contradictions it has sown within, the Taliban will continue to shape the destiny not only of Pakistan but of South Asia as a whole.

Deepawali: The Festival of Lights

■ **ER. PRABHAT KISHORE**

Bharatvarsha is the land of festivals. Deepawali or Diwali is one of them, which is celebrated on the Amavasya Tithi of Kartik Krishna Paksha month. The Shanti Mantra from Brihadaranyaka Upnishad "Tamso Ma Jyotirgamya" i.e. "Lead me from darkness to light" reveals its spiritual spirit.

Deepawali is a 5-day long festival, which starts from Dhanteras and ends on Bhaiya Dooj. Deepawali is mentioned in Padma Puran and Skand Puran. It is composed of two Sanskrit words "Deep" i.e. light or candle and meaning that which glows, illuminates or knowledge and "Awali" i.e. rows or series. Thus Deepawali means "Rows of Lights" or "Festival of Lights".

The first day, Dhanvantari Trayodashi or Dhanteras is celebrated to commemorate the arrival of Devi Lakshmi from Kshir Sagar (Ocean) during the Samudra Manthan (churning of the cosmic ocean of milk) by the Devas and Asuras to receive the Amrit (nectar). On this day, Bhagwan Dhanvantari also came out of the ocean with Ayurved for mankind. Bhagwan Kubera, the lord of wealth is also worshipped. Shopping for new items on this day is considered auspicious.

Chhoti Diwali, also termed as Narak Chaturdashi or Roop Chaudash, is the second day of the festival. It is celebrated because Bhagwan Krishna and his wife Satyabhama had killed demon king Narakasur of Pragiyotish and released nearly 16000 girls from demon's captivity. It is also believed that Devi Kali had made Narakasur disappear.

On the third day, the main Diwali is celebrated with great enthusiasm all over the world by lighting Deeyas (lamps) and bursting crackers. Devi Lakshmi and Bhagwan Ganesh are worshipped together to achieve the blessing of wealth & prosperity. Bhagwan Kubera is also worshipped by the devotees on this auspicious day.

According to mythology, once Devi Lakshmi was proud of herself that the whole world worships her and yearns to get her. Bhagwan Vishnu understood this feeling of his conscience and with the aim of breaking Lakshmi's pride, he said that "Devi, even though the whole universe yearns to have you, you are not yet complete".



Lakshmiiji narrated her woes to her Sakhi (friend) Parvatiji and asked her to adopt Ganesh, one of her two sons. Lakshmiiji adopted Ganesh with the consent of Parvatiji and since then Ganesh was came to be called the adopted son of Devi Lakshmi. Being very pleased Devi Lakshmi gave a boon to Ganesh that "I will fulfill the wishes of the devotees only when they will worship you along with me". For this reason, there is a Vidhan (law) to worship Ganesh along with Lakshmi in Diwali.

There are several beliefs behind this festival. In Treta Yuga, Raja Ramechandra along with Sita, Lakshman & Hanuman returned to Ayodhya from Lanka on this day after victory over Ravana and people celebrated the occasion by lighting Deeyas and decorating Rangolis.

On this auspicious day the Nirvan Diwas of Bhagwan Mahavir, 24th Tirthankar of Jain, is observed by the followers of Jainism.

The Sikh community celebrates this day to mark the

release of Guru Hargovind Maharaj from Mugal prison and his arrival at the Holy Swarnmandir, Amritsar.

The fourth day is the Govardhan Puja or Padwa. Bhagwan Krishna had lifted the Govardhan parvat and held it up to protect the people and cattle from the rain & thunder produced by the angry Indra. When Indra conceded defeat, the people of Brajhooni started performing the Govardhan Puja on the request of Krishna.

Bhatri-Dwitiya or Bhaiya Dooj or Bhai Teeka or Yam-Dwitiya is the fifth and last day of Diwali. This day is dedicated to sisters. Yamraj (the lord of death) had visited his sister Yamuna on this day and gave her a Vardan (boon) that whoever visits his sister on this day will be liberated from all sins and will achieve Moksha or final emancipation. As per another belief, Krishna had visited his sister Subhadra after defeating Narakasur, who welcomed him with a tilak on his forehead.

The festival of Deepawali not only has religious or spiritual significance, but it also has scientific importance. The clay Deeyas with oil and cotton wick are eco-friendly and don't leave any harmful residue. During monsoon, the air is moist and full of bacteria & fungus. The heat generated from the Deeya destroys the bacteria, insects, fungus and thus cleans the air. The magnesium present in the Deeya's oil reacts with harmful Sulphur and Carbon Dioxide present in the air to form Sulphate and Carbonates and purify the environment.

The Panch Tatwa (five elements of the universe)-Kshiti (Earth), Jal (Water), Pawak (Fire), Gagan (Sky) and Sameer (Air)- is represented by the Deeya. The Earth element is represented by the clay Deeya, oil & cotton wick. Water is produced during the combustion of oil. Fire is represented by the light generated, Sky by the light around the flame, and Air by the oxygen diffused to the wick.

Deepawali symbolizes the victory of light over darkness, good over evil, knowledge over ignorance and hope over despair. It is the season of celebration and there is joy, light and happiness everywhere around us. It illuminates the houses as well as hearts and spread the message of global friendship and togetherness.

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