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## Editorial .....

Artificial Intelligence has emerged as one of the most transformative forces in modern science, functioning not merely as a computational tool but as an active collaborator in discovery, significantly accelerating research processes, enhancing predictive modeling, and expanding experimental capability. Statistical evidence indicates that AI can reduce data-analysis time by nearly 50–60%, improve materials discovery efficiency by about 40%, and shorten drug-development timelines by up to 50%, while AI-assisted scientists publish more than three times as many papers and receive nearly five times higher citations, reflecting a measurable rise in scientific productivity and influence. Economically, AI reduces research costs by roughly 25%, cuts literature-review time by up to 70%, and improves laboratory safety through automation and predictive maintenance, thereby optimizing both financial and operational dimension<sup>107269s</sup> of science. Futuristically, AI is poised to drive autonomous laboratories, generative hypothesis systems, quantum-AI simulations, and multiscale biological engineering, potentially redefining how knowledge itself is produced. However, these advantages are counterbalanced by structural and epistemic disadvantages: studies suggest a contraction of scientific diversity by around 4.6% and reduced scholarly collaboration as researchers cluster around data-rich problems best suited to AI methods; over-reliance on algorithmic ideation risks diminishing human creativity and conceptual originality; biased training datasets can distort biomedical and social conclusions; and AI-generated summaries may misinterpret or overgeneralize scientific findings, introducing misinformation risks. Furthermore, unequal access to AI infrastructure may widen global and institutional research disparities even as language tools democratize publication. Consequently, AI's impact on science is asymmetrical — it powerfully amplifies empirical, data-intensive research while posing challenges to exploratory, theory-driven inquiry. The future of science will therefore depend not on whether AI is advantageous or disadvantageous, but on how responsibly it is governed, ethically integrated, and symbiotically aligned with human curiosity, critical reasoning, and methodological rigor.



Future research on artificial intelligence must move beyond core algorithmic advancement and increasingly focus on its societal integration, particularly in areas such as employment generation, youth development, rural technological empowerment, and structured AI education. Studies are expected to examine how AI can create new job ecosystems—ranging from data engineering, robotics maintenance, Agri-AI services, and digital healthcare facilitation—while simultaneously addressing displacement risks through reskilling frameworks and human-AI collaborative work models. For youth development, future research will likely explore AI-enabled personalized learning systems, cognitive skill mapping, creativity augmentation tools, and innovation incubators that prepare young populations for next-generation scientific and

entrepreneurial roles. In rural contexts, AI research is projected to prioritize low-cost, vernacular, and infrastructure-adaptive technologies such as precision agriculture, climate advisory systems, smart irrigation, livestock health monitoring, rural telemedicine, and micro-enterprise automation, thereby narrowing the urban–rural digital divide. Equally critical is the expansion of AI education research, focusing on curriculum design, ethical AI literacy, interdisciplinary integration, and early-stage exposure from school to university levels to build an AI-ready workforce grounded in scientific responsibility. Collectively, these future research directions position AI not only as a technological advancement but as a socio-economic catalyst capable of shaping inclusive development, workforce transformation, and knowledge democratization.

National Science Day 2026, observed under the theme “**Fostering Public Trust in Science**,” highlights the vital responsibility of the scientific community to strengthen the bond between research and society. In an era shaped by rapid technological advancement, misinformation, and complex global challenges, public confidence in scientific evidence, ethical innovation, and transparent communication has never been more crucial. This day commemorates not only the discovery of the Raman Effect but also the enduring spirit of inquiry that drives national progress. It calls upon scientists, institutions, and educators to make science more accessible, socially relevant, and people-centric—ensuring that research outcomes directly benefit public welfare, environmental sustainability, healthcare, and technological self-reliance. On this meaningful occasion, heartfelt wishes are extended to young research scholars and students, the torchbearers of India’s scientific future. Your curiosity, dedication, and integrity are the foundations upon which public trust is built. May you pursue knowledge with responsibility, innovate with purpose, and contribute to science in ways that inspire confidence, serve humanity, and advance the nation toward a brighter, evidence-driven future.

Editor in Chief

S.Vijikumar

Cover image: Downy Rose Myrtle or Hill Gooseberry - *Rhodomyrtus tomentosa* Wight.,  
family : Myrtaceae - IUCN Status – Least Concern

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